

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name State Antelope 31-34-16HNB

Location NWNE SEC 16 T5N R62W

State COLORADO

Country USA

API Number 05-123-37404

Region DJ BASIN

Spud Date 8/4/2013

Surface Coordinates 655' FNL x 1730' FEL (Lat: 40.40534, 104.32511)

Bottom Hole Coordinates 470' FSL x 1949' FEL (Lat: 40.39380, 104.32628)

County WELD

Rig Number ENSIGN 128

Field WATTENBERG

Drilling Completed 8/11/2013

Ground Elevation 4772'

K.B. Elevation 4787'

Logged Interval 6050' **To** 11056'

Total Depth 11056'

Formation NIORARA B CHALK

Type of Drilling Fluid H2O, LSND

Company Bonanza Creek

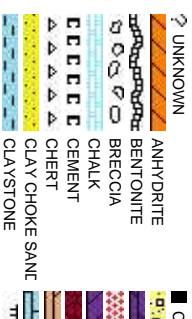
Address 410 17th Street
Denver, CO 802

Name Paul McKay

Company Bonanza Creek

Address 410 17th Street
Denver, CO 802

Wellsite Geologists



Operator

Energy Inc.

Suite 1500
202

Geologist

Energy Inc.

, Suite 1500
202

Other

Eli Smith
Kevin Geraghty
Cameron Nakos

Rock Types

	METAMORPHIC		SHALY SILTSTONE
	NO SAMPLE		SILTY SHALE
	SALT		SILTSTONE
	SANDSTONE		TILL
	SALT-PEPPER SAND		TUFF
	SHALE		WELDED TUFF
	SHALE COLORED		
	SHALE GRAY		
	LIMESTONE		
	MARLSTONE		
	SHALY SANDSTONE		

Accessories

	F FOSSIL		ARGILLACEOUS		GLAUCONITE		TUFFACEOUS
	GASTROPOD		ARGILLITE GRAIN		GYPSEIFEROUS		
	OOLITE		B BENTONITE		HEAVY MINERAL		
	AMPHIPORA		BITUMINOUS SUBSTANCE		INOCERAMUS		ANHYDRITE STRINGER
	BELEMNITE		BRECCIA FRAGMENTS		KAOLIN		BENTONITE STRINGER
	BIOCLASTIC		CALCAREOUS		MARLSTONE		COAL STRINGER
	BRACHIOPOD		CARBONACEOUS FLAKES		MINERAL CRYSTALS		DOLOMITE STRINGER
	BRYOZOA		CHTDK		NODULES		GYPNUM STRINGER
	CEPHALOPOD		CHTLT		PHOSPHATE PELLETS		LIMESTONE STRINGER
	CORAL		COAL - THIN BEDS		PYRITE		MARLSTONE (CALO) STRG
	CRINOID		DOLOMITIC		SALT CAST		MARLSTONE (DOL) STRG
	ECHINOID		FELDSPAR		SANDY		SANDSTONE STRINGER
	FISH		FERRUGINOUS PELLET		SILTACEOUS		SHALE STRINGER
	FORAMINIFERA		ANHYDRITIC		SILTY		SILTSTONE STRINGER

Other Symbols

	MOLDIC		FAULT		WIRELINE TESTED - LEFT		E EARTHY
	ORGANIC		FORMATION TOP		WIRELINE TESTED - RT		FX FINELY SILTY
	PINPOINT		GAS SHOW		L LITHOGRAPIC		ES GRAINSTONE
	EVEN		MINDEPTH MN DEPTH		A ANGULAR		MX MICRO SILTY
	QUESTIONABLE		NORMAL FAULT		R ROUNDED		MS MUDSTONE
	SPOTTED STAINING		OIL SHOW		B SUBANG		PS PACKSTONE
	Porosity		OVERTURNED STRATA		SUBRND		WS WACKESTONE
	E EARTHY		REVERSE FAULT		Textures		
	FENESTRAL		SIDEWALL CORE (LEFT)		B\$ BOUNDSTONE		M MODERATE
	FRACTURE		SIDEWALL CORE (RIGHT)		C CHALKY		P POOR
	INTERCRYSTALLINE		SLIDE		CX CRYPTOXLN		W WELL
	INTEROOLITIC		CORE - LOST				
			CORE - RECOVERED				
			DST INTERVAL				

ROP
ROF
GAMMA

Bit #: 3
Type: HE04JMRSV
Size: 8.75
Depth In: 5.867'
Jets: 3/20
S/N: 1376473

Total Gas & Chromatograph
GAS
C1
C2
C3
C4
CO2

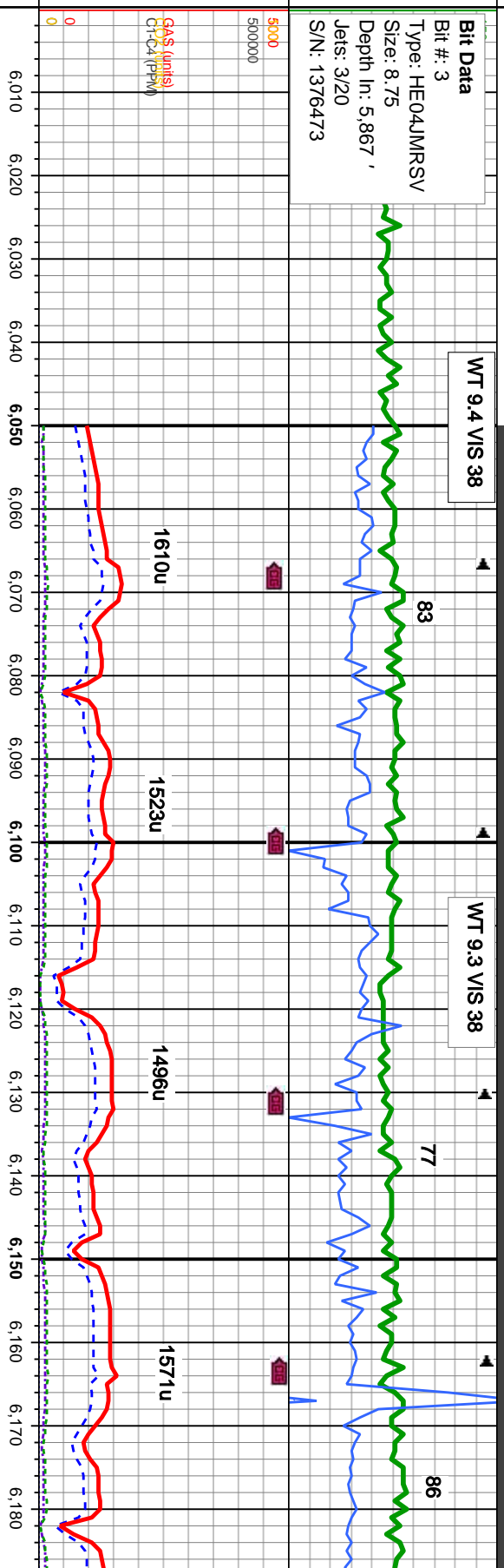
Depth Labels

% Lith

Well Bore
TVD

Oil Show

Images



COLUMBINE LOGGING
RIGGED UP ON
08/07/2013 MANNED
2-PERSON LOGGING
WITH BLOODHOUND
GAS CHROMATOGRAPH
UNIT #0608 BEGAN ON
08/07/2013

MD: 6,077'
TVD: 6,019.63'
Inclination: 20.2°
Azimuth: 181.7°
VS: -590.11'

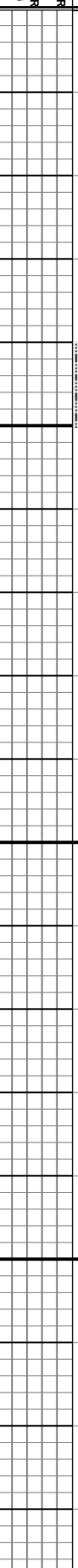
MD: 6,109'
TVD: 6,049.35'
Inclination: 23.2°
Azimuth: 180.1°
VS: -578.3'

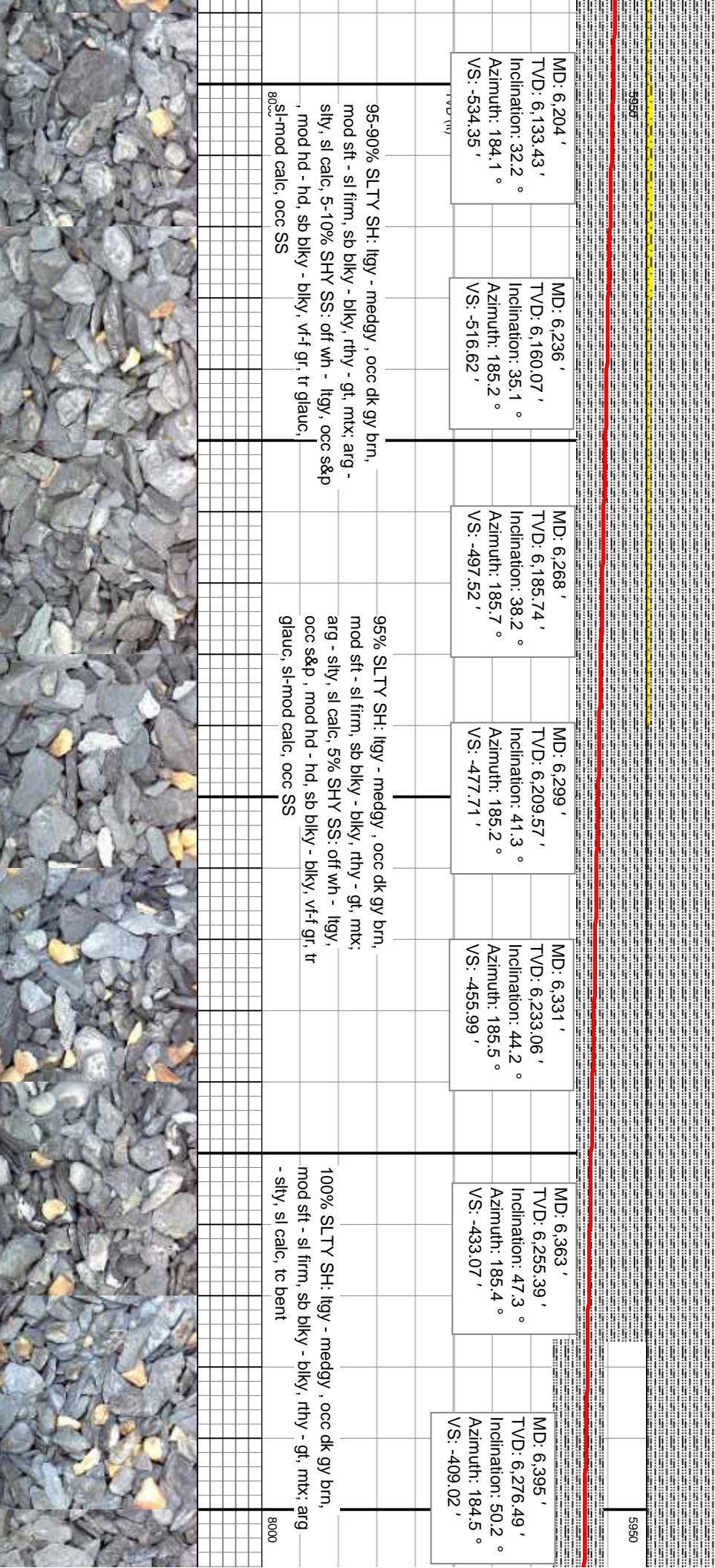
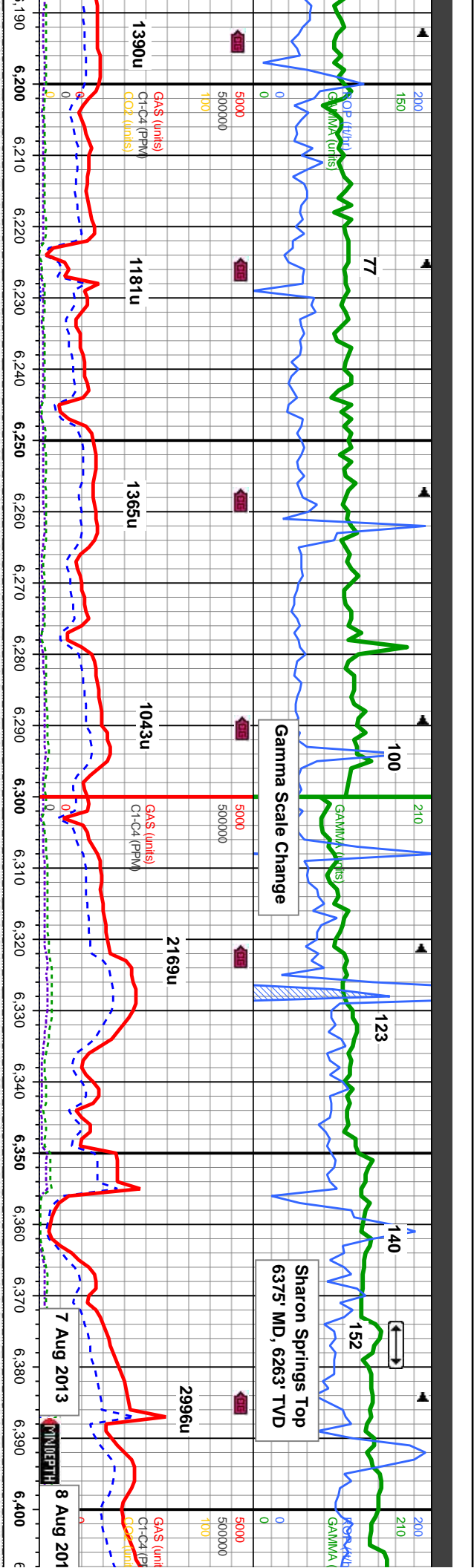
MD: 6,141'
TVD: 6,078.44'
Inclination: 26.1°
Azimuth: 180.6°
VS: -564.99'

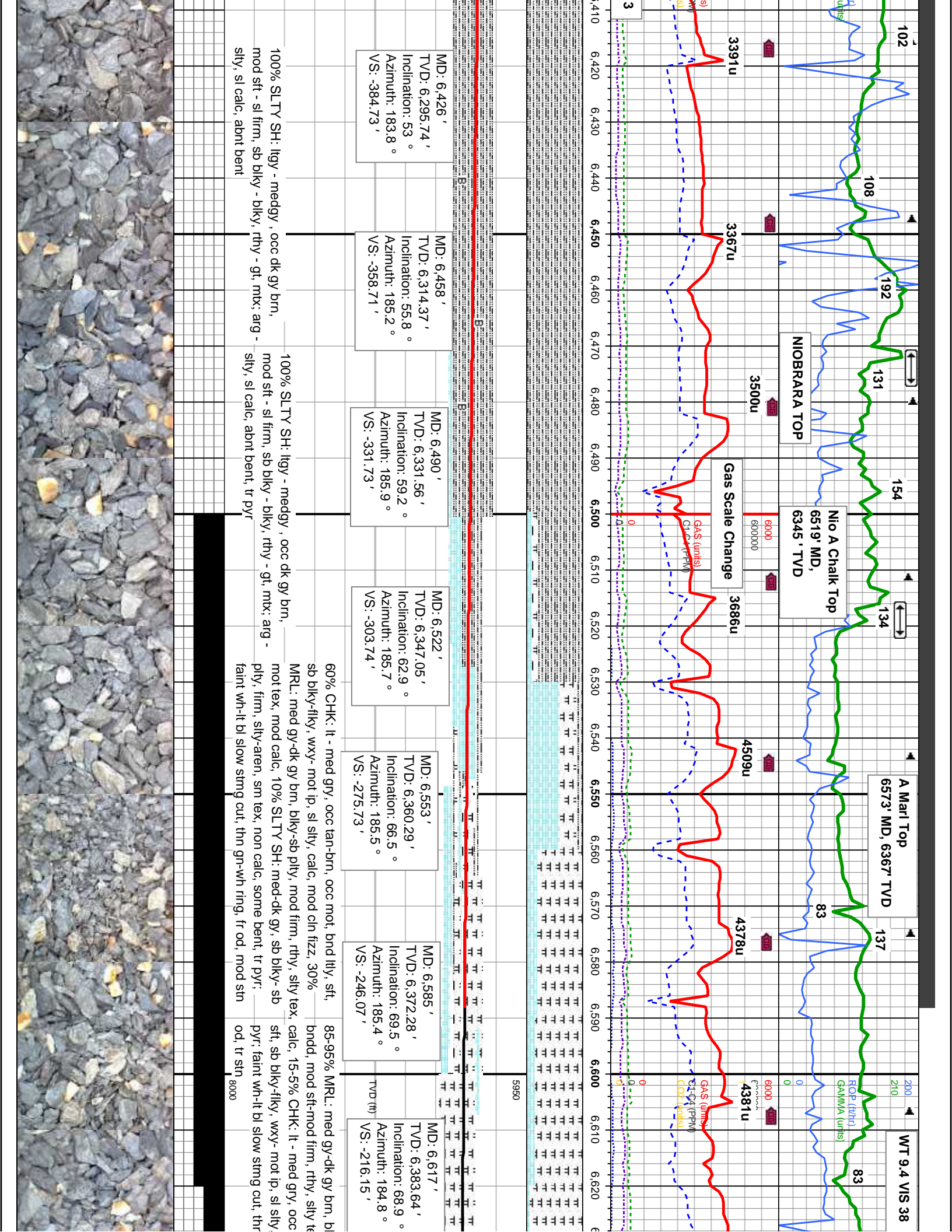
MD: 6,172'
TVD: 6,105.9'
Inclination: 29.1°
Azimuth: 181.7°
VS: -550.65'

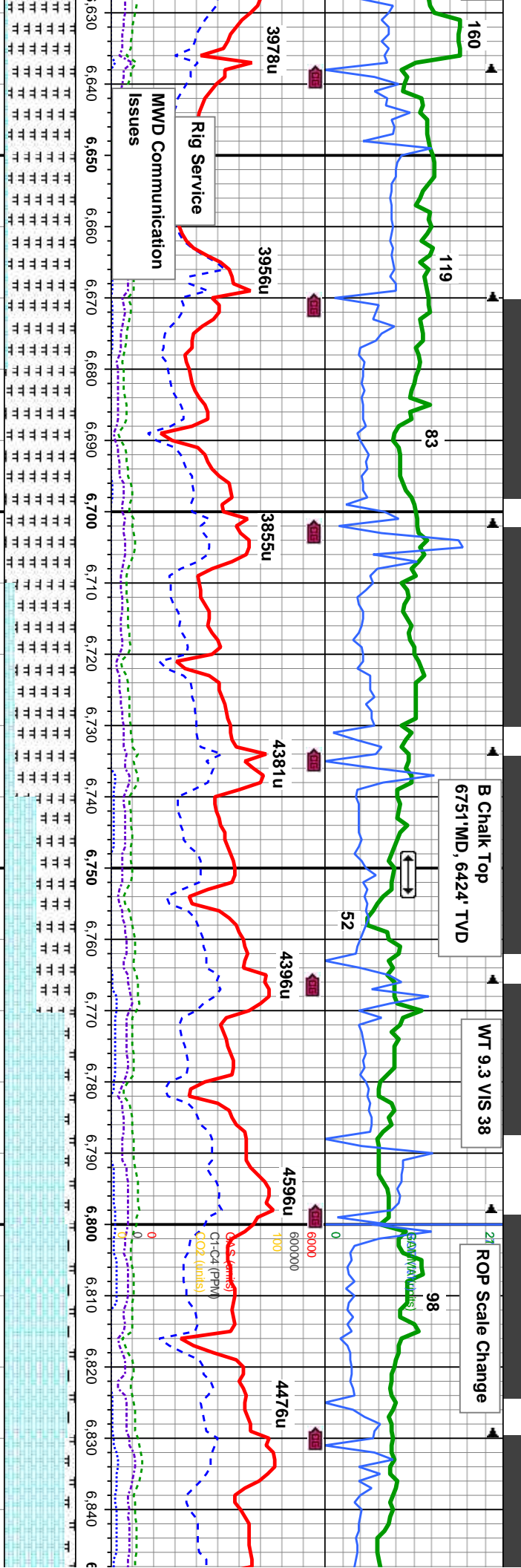
90-85% SLTY SH: itgy - medgy, occ dk gy brn, mod sft - sl firm, sb blkly - blkly, rthy - gt, mx; arg - slty, sl calc, 10-15% SHY SS: off wh - itgy, occ s&p, mod hd -hd, sb blkly - blkly, vf-f gr, tr glauc, sl-mod calc, occ SS

90-85% SLTY SH: itgy - medgy, occ dk gy brn, mod sft - sl firm, sb blkly - blkly, rthy - gt, mx; arg - slty, sl calc, 10-15% SHY SS: off wh - itgy, occ s&p, mod hd -hd, sb blkly - blkly, vf-f gr, tr glauc, sl-mod calc, occ SS

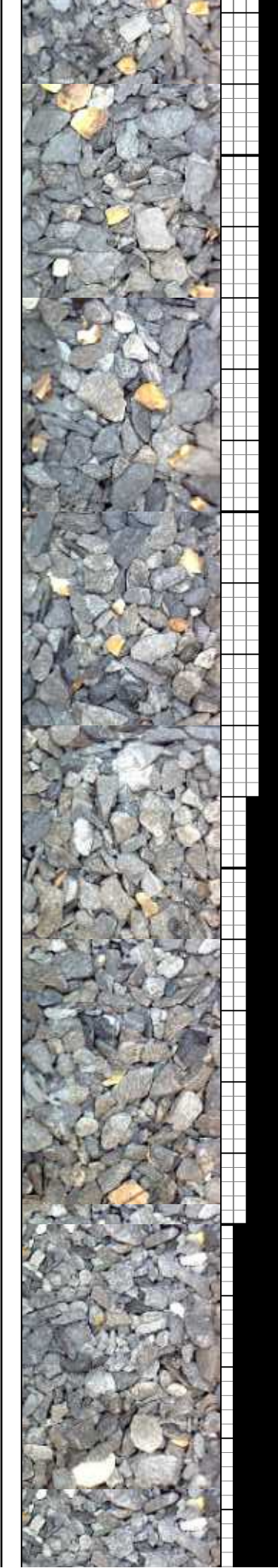


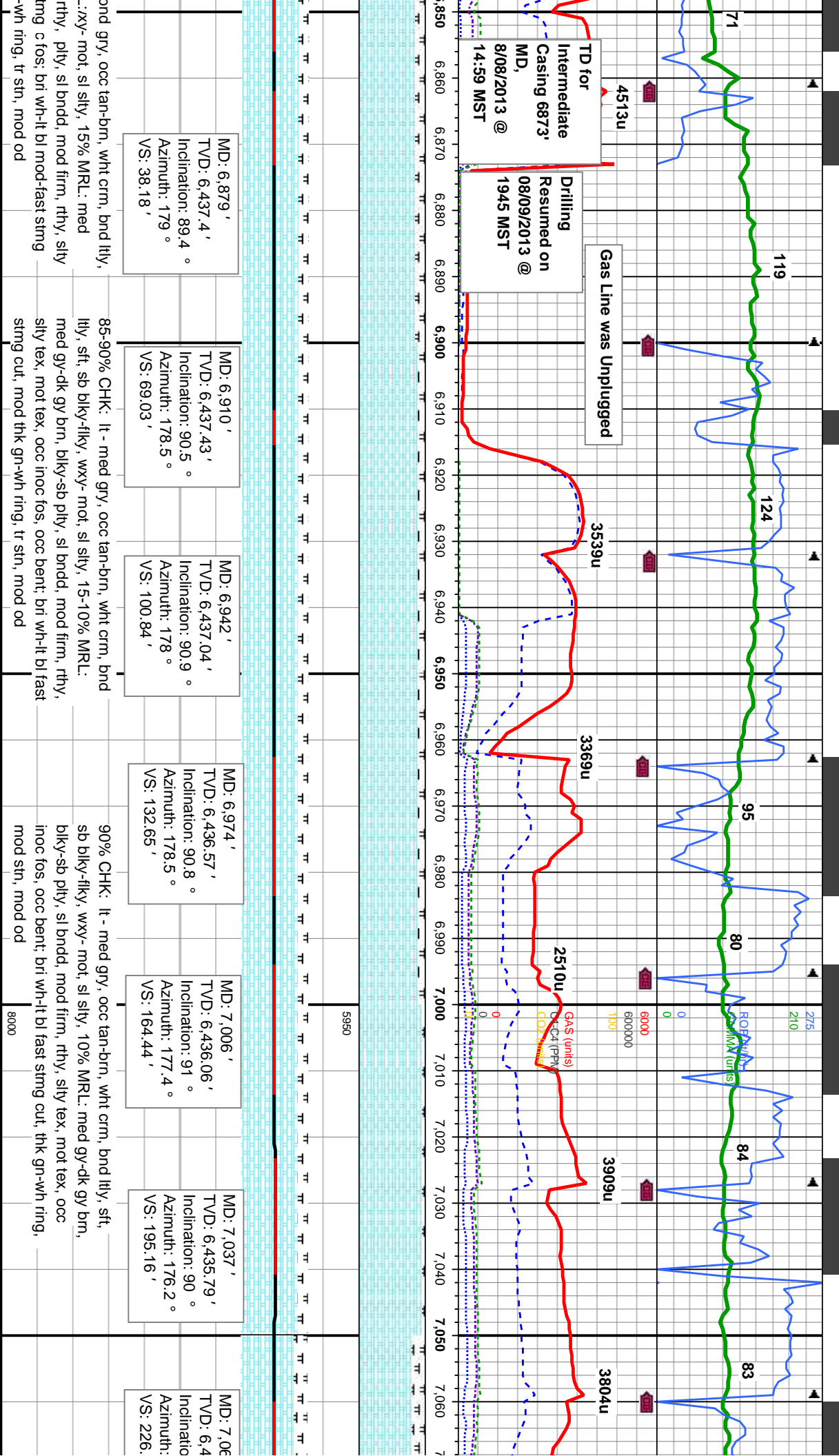






MD (ft)	TVD (ft)	Inclination (°)	Azimuth (°)	VS (ft)	Notes
6,649	6,395.19	68.8	184.3	-186.31	MD: 6,649 ' TVD: 6,395.19 ' Inclination: 68.8 ° Azimuth: 184.3 ° VS: -186.31 ' ky-sb pilty, occ max, mot tex, mod tan-brn, bnd lily, calc, occ bent, tr ong-yel ring, sl stn
6,681	6,406.26	70.7	183.6	-156.29	MD: 6,681 ' TVD: 6,406.26 ' Inclination: 70.7 ° Azimuth: 183.6 ° VS: -156.29 ' 95-99% MRL: med gy-dk gy brn, blk-y-sb pilty, occ brndd, mod sft-mod firm, rthy, sily tex, mot tex, mod calc, 5-1% CHK: lt - med gry, occ tan-brn, bnd lily, sft, sb blk-y-flky, wxy- mot ip, sl sily, calc, occ bent, tr pyr, faint wh-it bl slow sting cut, thn gn-wh ring, sl od, sl tr stn
6,712	6,415.66	74	182.4	-126.76	MD: 6,712 ' TVD: 6,415.66 ' Inclination: 74 ° Azimuth: 182.4 ° VS: -126.76 ' 85-65% MRL: med gy-dk gy brn, blk-y-sb pilty, sl brndd, mod sft-mod firm, rthy, sily tex, mot tex, mod calc, 15-35% CHK: tan-brn, lt - med gry, bnd lily, sft, sb blk-y-flky, wxy- mot ip, sl sily, faint wh-it bl slow sting cut, thn gn-wh ring, sl od, sl tr stn
6,744	6,423.54	77.5	181	-95.79	MD: 6,744 ' TVD: 6,423.54 ' Inclination: 77.5 ° Azimuth: 181 ° VS: -95.79 ' 85-65% MRL: med gy-dk gy brn, blk-y-sb pilty, sl brndd, mod sft-mod firm, rthy, sily tex, mot tex, mod calc, 15-35% CHK: tan-brn, lt - med gry, bnd lily, sft, sb blk-y-flky, wxy- mot ip, sl sily, faint wh-it bl slow sting cut, thn gn-wh ring, sl od, sl tr stn
6,776	6,429.53	80.9	179.7	-64.44	MD: 6,776 ' TVD: 6,429.53 ' Inclination: 80.9 ° Azimuth: 179.7 ° VS: -64.44 ' 85-90% CHK: lt - med gry, occ tan-brn, wht crm, lily, sft, sb blk-y-flky, wxy- mot, sl sily, 15-10% MRL med gy-dk gy brn, blk-y-sb pilty, sl brndd, mod firm, sily tex, mot tex, tr inoc fos: bri wh-it bl mod-fast s cut, mod thk gn-wh ring, mod od, mod stn thk gn
6,808	6,433.74	84	179	-32.85	MD: 6,808 ' TVD: 6,433.74 ' Inclination: 84 ° Azimuth: 179 ° VS: -32.85 ' 85-90% CHK: lt - med gry, occ tan-brn, wht crm, lily, sft, sb blk-y-flky, wxy- mot, sl sily, 15-10% MRL med gy-dk gy brn, blk-y-sb pilty, sl brndd, mod firm, sily tex, mot tex, tr inoc fos: bri wh-it bl mod-fast s cut, mod thk gn-wh ring, mod od, mod stn thk gn
6,821	6,434.92	85.6	178.8	-19.46	MD: 6,821 ' TVD: 6,434.92 ' Inclination: 85.6 ° Azimuth: 178.8 ° VS: -19.46 ' 85-90% CHK: lt - med gry, occ tan-brn, wht crm, lily, sft, sb blk-y-flky, wxy- mot, sl sily, 15-10% MRL med gy-dk gy brn, blk-y-sb pilty, sl brndd, mod firm, sily tex, mot tex, tr inoc fos: bri wh-it bl mod-fast s cut, mod thk gn-wh ring, mod od, mod stn thk gn





MD: 6,879 '
 TVD: 6,437.4 '
 Inclination: 89.4 °
 Azimuth: 179 °
 VS: 38.18 '

MD: 6,910 '
 TVD: 6,437.43 '
 Inclination: 90.5 °
 Azimuth: 178.5 °
 VS: 69.03 '

MD: 6,942 '
 TVD: 6,437.04 '
 Inclination: 90.9 °
 Azimuth: 178 °
 VS: 100.84 '

MD: 6,974 '
 TVD: 6,436.57 '
 Inclination: 90.8 °
 Azimuth: 178.5 °
 VS: 132.65 '

MD: 7,006 '
 TVD: 6,436.06 '
 Inclination: 91 °
 Azimuth: 177.4 °
 VS: 164.44 '

MD: 7,037 '
 TVD: 6,435.79 '
 Inclination: 90 °
 Azimuth: 176.2 °
 VS: 195.16 '

MD: 7,060 '
 TVD: 6,435.4 '
 Inclination: 90 °
 Azimuth: 176.2 °
 VS: 226.00 '

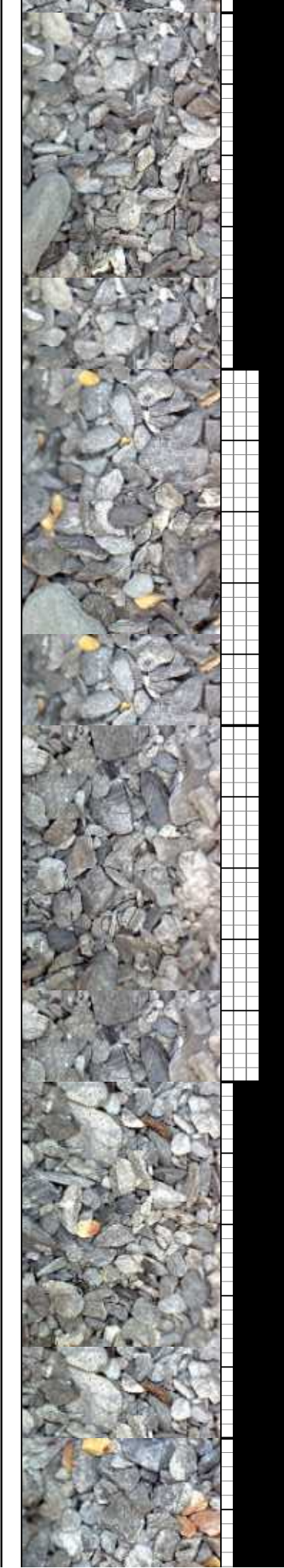
ond gry, occ tan-brn, wht crm, bnd lily, ...xy- mot, sl silty, 15% MRL: med rthy, plty, sl bndd, mod firm, rthy, silty stmg c fos: bri wh-it bl mod-fast stmg wh ring, tr stn, mod od

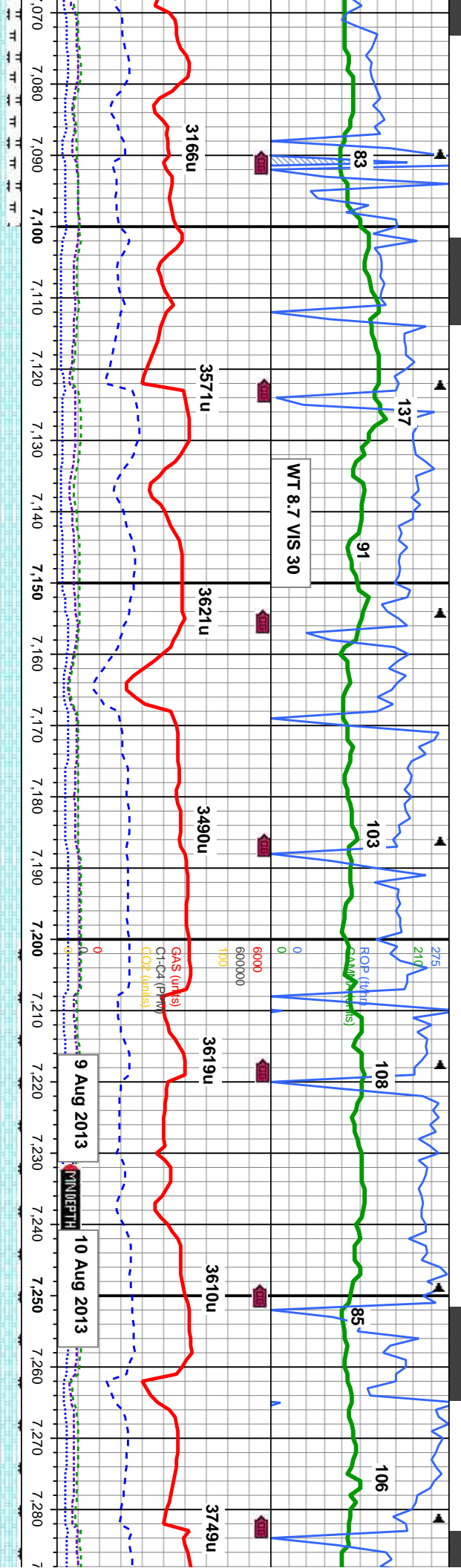
85-90% CHK: lt - med gry, occ tan-brn, wht crm, bnd lily, sft, sb blk-y-flky, wxy- mot, sl silty, 15-10% MRL: med gy-dk gy brn, blk-y-sb plty, sl bndd, mod firm, rthy, silty tex, mot tex, occ inoc fos, occ bent; bri wh-it bl fast stmg cut, mod thk gn-wh ring, tr stn, mod od

90% CHK: lt - med gry, occ tan-brn, wht crm, bnd lily, sft, sb blk-y-flky, wxy- mot, sl silty, 10% MRL: med gy-dk gy brn, blk-y-sb plty, sl bndd, mod firm, rthy, silty tex, mot tex, occ inoc fos, occ bent; bri wh-it bl fast stmg cut, thk gn-wh ring, mod stn, mod od

5950

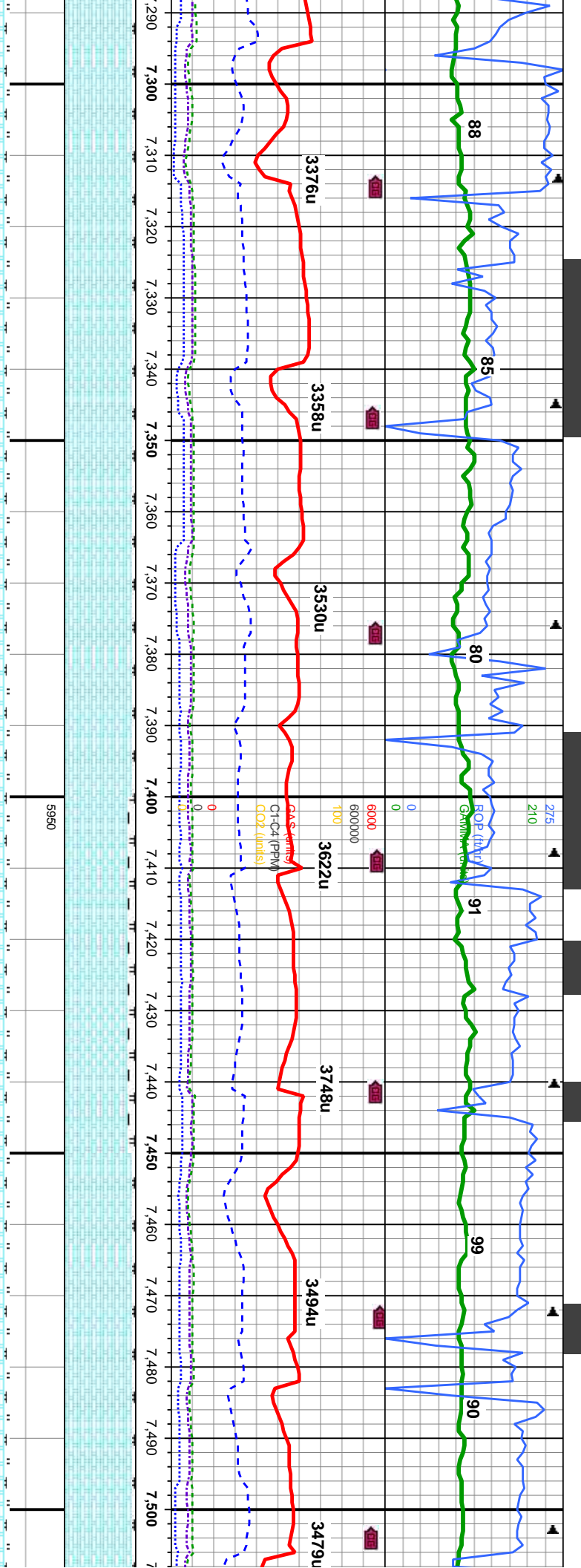
8000





MD: 7,101'	MD: 7,133'	MD: 7,164'	MD: 7,196'	MD: 7,228'	MD: 7,260'	MD: 7,260'
TVD: 6,437.47'	TVD: 6,439.09'	TVD: 6,440.2'	TVD: 6,440.53'	TVD: 6,440.61'	TVD: 6,441.09'	TVD: 6,441.09'
Inclination: 87°	Inclination: 87.2°	Inclination: 88.7°	Inclination: 88.7°	Inclination: 90.1°	Inclination: 89.6°	Inclination: 88.7°
Azimuth: 177.8°	Azimuth: 178.1°	Azimuth: 178.8°	Azimuth: 181°	Azimuth: 181°	Azimuth: 180.3°	Azimuth: 179.4°
VS: 258.56'	VS: 290.32'	VS: 321.13'	VS: 353.02'	VS: 384.95'	VS: 416.85'	VS: 416.85'
95-80% CHK: lt - med gry, occ tan-brn and dk gy, wht crm, bnd lily, sft, sb blk-y-flky, wxy- mot, sl silty, 5-20% MRL: med gy-dk gy brn, blk-y-sb plty, sl bndd, mod firm, rthy, silty tex, mod tex, occ inoc fos: bri wh-lt bl fast stmg cut, thk gn-wh ring, mod stn, mod od	100% CHK: med-dk gry, occ tan-brn and lt gy, wht crm, bnd lily, sft, sb blk-y-flky, wxy- mot, sl silty, occ inoc fos, occ bent: bri wh-lt bl fast stmg cut, thk gn-wh ring, mod stn, mod od	95% CHK: lt - med sb blk-y-flky, wxy- m blk-y-sb plty, sl bndd inoc fos, occ bent: r mod thk yel-orm rin				





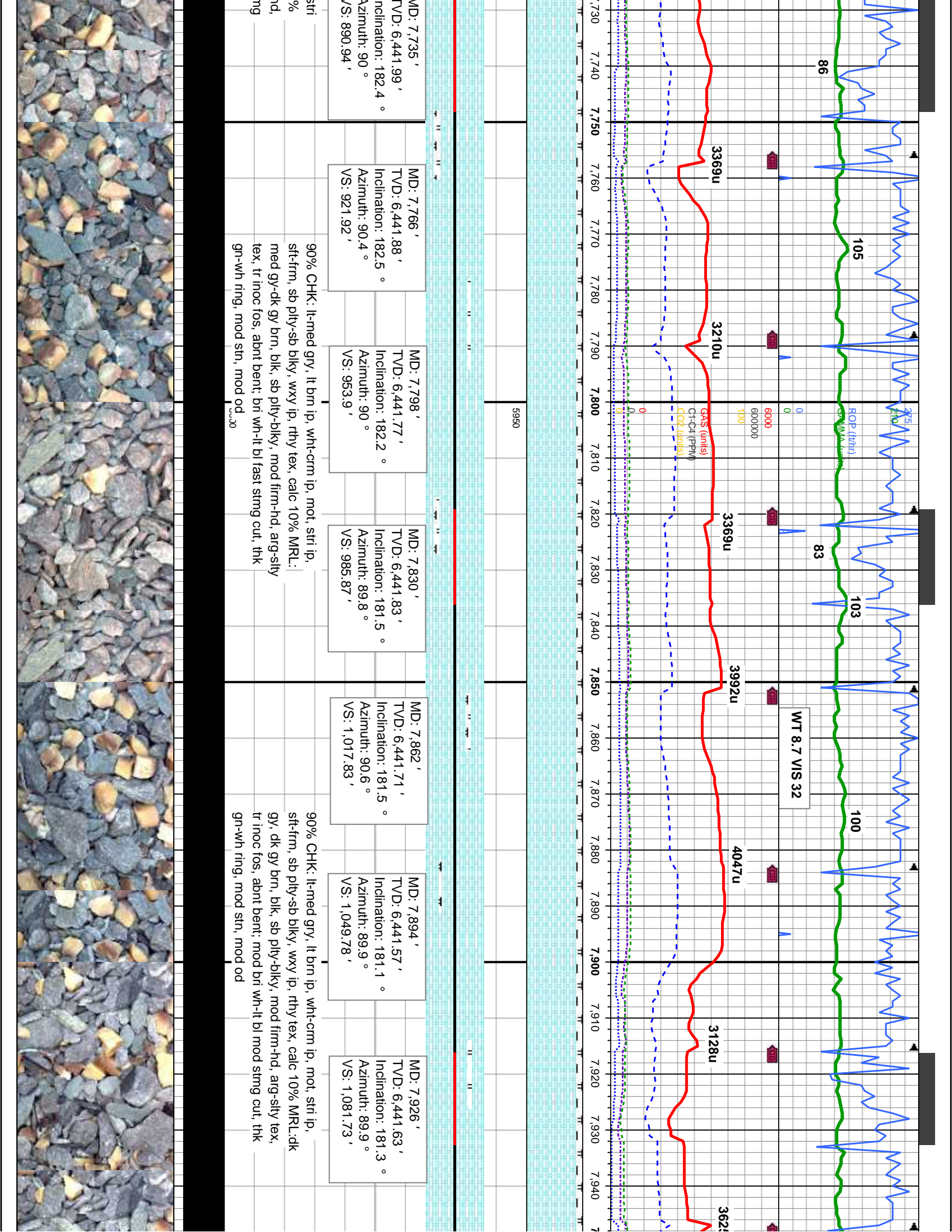
MD: 7,291'	MD: 7,323'	MD: 7,365'	MD: 7,387'	MD: 7,418'	MD: 7,450'	MD: 7,482'
TVD: 6,441.62'	TVD: 6,441.93'	TVD: 6,442.01'	TVD: 6,441.85'	TVD: 6,441.52'	TVD: 6,441.52'	TVD: 6,441.75'
Inclination: 89.3°	Inclination: 89.6°	Inclination: 90.1°	Inclination: 90.5°	Inclination: 90.7°	Inclination: 89.3°	Inclination: 89.9°
Azimuth: 180.3°	Azimuth: 180.8°	Azimuth: 181.1°	Azimuth: 182.2°	Azimuth: 182.4°	Azimuth: 181.1°	Azimuth: 181.8°
VS: 47.25'	VS: 479.17'	VS: 511.11'	VS: 543.07'	VS: 574.05'	VS: 606.01'	VS: 637.97'

gry, occ tan-brn, wht crm, bnd lfly, sft, bot, sl silty, 5% MRL; med gy-dk gy brn, mod firm, rthy, silty tex, mot tex, occ mod bri wh-it bl mod-fast stmg cut, g, mod str, mod od

95% CHK: med-dk gry, occ lt gy, wht crm, bnd lfly, sft, sb blkly-flky, wxy- mot, sl silty, 5% MRL; med gy-dk gy brn, blkly-sb ply, sl bndd, mod firm, rthy, silty tex, mot tex, occ inoc fos, fr od, occ bent; mod bri wh-it bl mod-fast stmg cut, mod thk yel gn ring, mod str, mod od

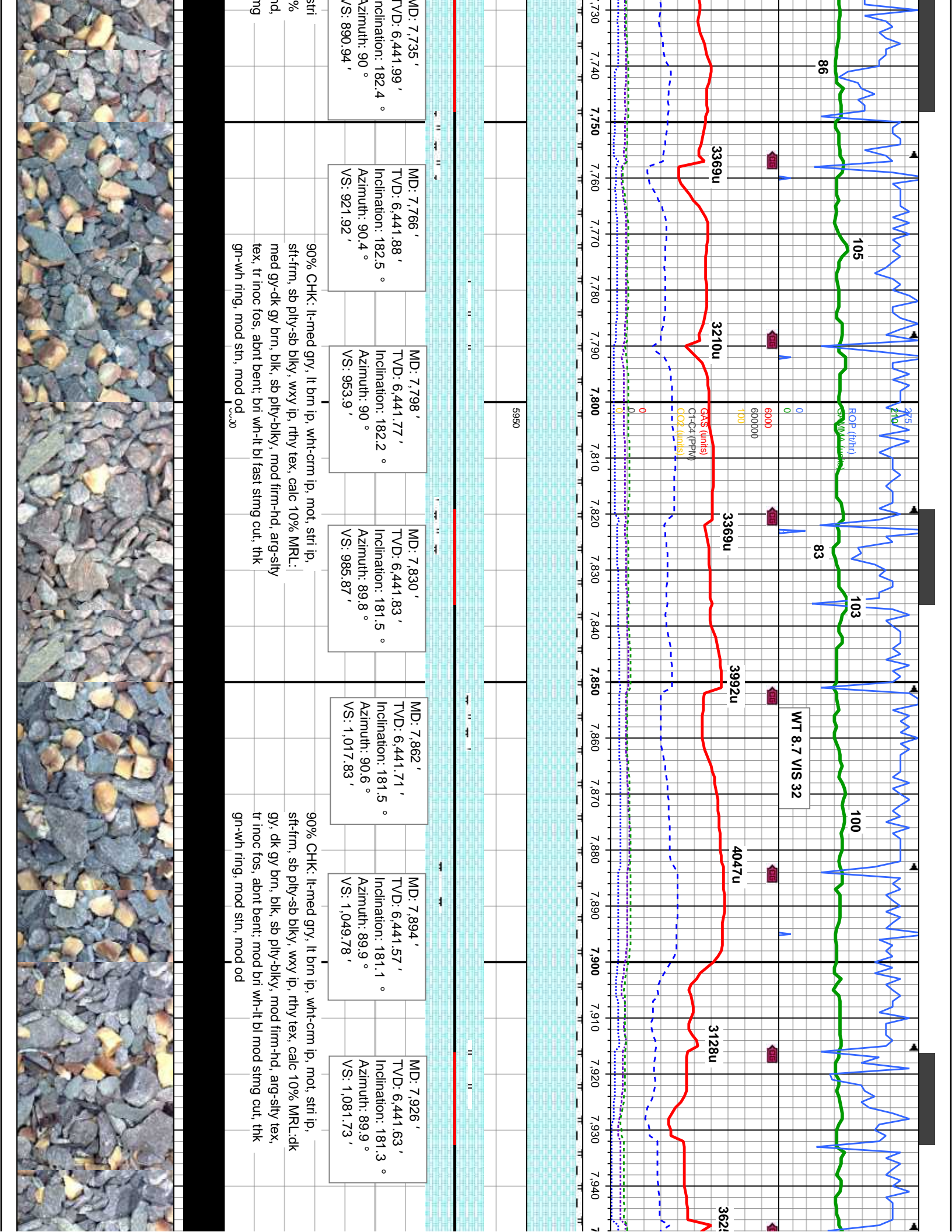
90-95% CHK: med-dk gry, occ lt gy, w sft, sb blkly-flky, wxy- mot, sl silty, 10-5 gy-dk gy brn, blkly-sb ply, sl bndd, mo tex, mot tex, occ inoc fos, occ bent; br stmg cut, thk gn-wh ring, mod str, mo

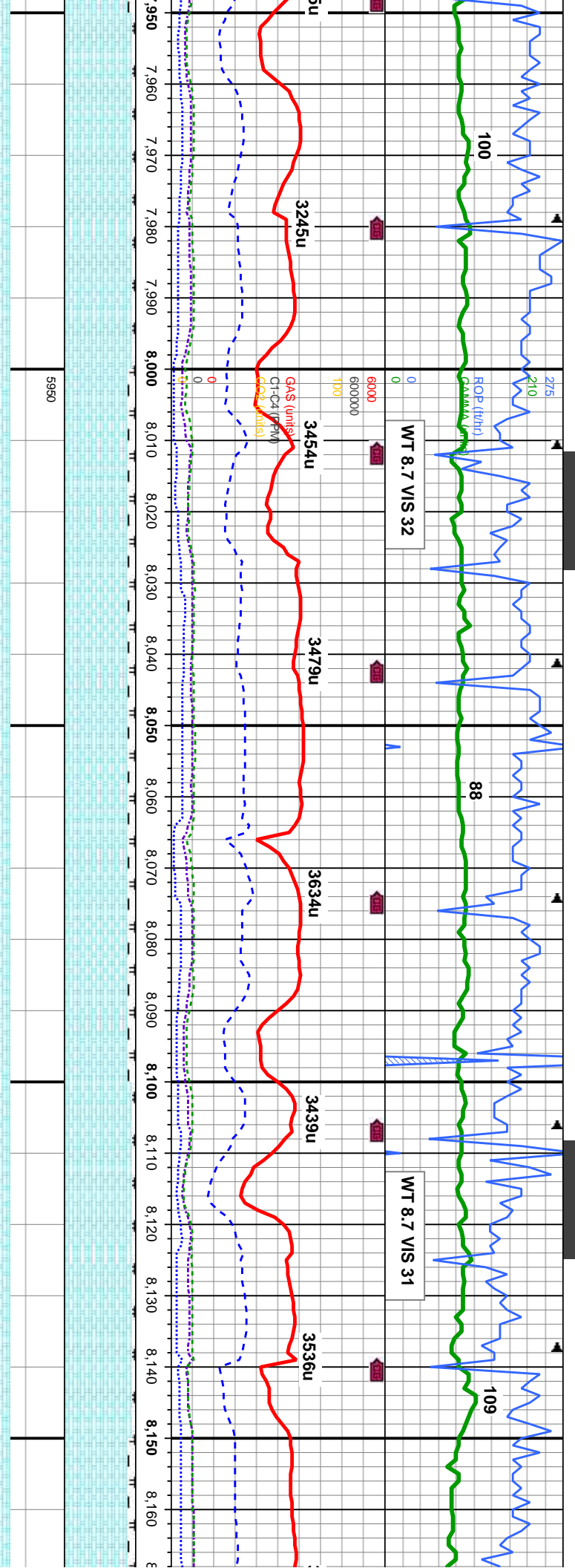




MD (ft)	TVD (ft)	Inclination (°)	Azimuth (°)	VS (ft)
7,735	6,441.99	182.4	90	890.94
7,766	6,441.88	182.5	90.4	921.92
7,798	6,441.77	182.2	90	953.9
7,830	6,441.83	181.5	89.8	985.87
7,862	6,441.71	181.5	90.6	1,017.83
7,894	6,441.57	181.1	89.9	1,049.78
7,926	6,441.63	181.3	89.9	1,081.73

90% CHK: lt-med gry, lt brn ip, wht-orm ip, mot, stri ip, sft-frm, sb pty-sb blk, wxy ip, rthy tex, calc 10% MRL: dk med gy-dk gy brn, blk, sb pty-blky, mod firm-hd, arg-sily tex, tr inoc fos, abnt bent: bri wh-lt bl fast stmg cut, thk gn-wh ring, mod stn, mod od



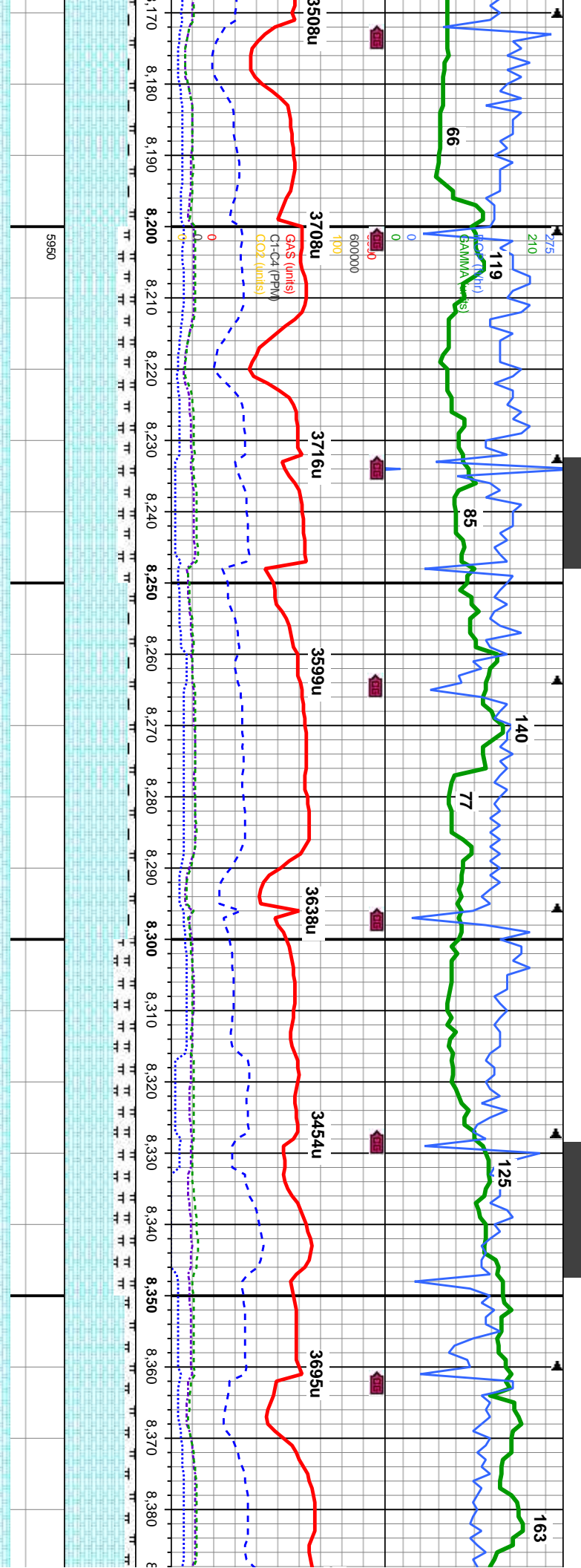


MD: 7,958'	MD: 7,989'	MD: 8,021'	MD: 8,053'	MD: 8,084'	MD: 8,116'	MD: 8,148'
TVD: 6,441.52'	TVD: 6,441.41'	TVD: 6,441.55'	TVD: 6,441.38'	TVD: 6,441.08'	TVD: 6,441.06'	TVD: 6,441.03'
Inclination: 181.8°	Inclination: 181.3°	Inclination: 181.3°	Inclination: 181.8°	Inclination: 181°	Inclination: 181.1°	Inclination: 181°
Azimuth: 90.5°	Azimuth: 89.9°	Azimuth: 89.6°	Azimuth: 91°	Azimuth: 90.1°	Azimuth: 90°	Azimuth: 90.1°
VS: 1,113.69'	VS: 1,144.65'	VS: 1,176.6'	VS: 1,208.56'	VS: 1,239.51'	VS: 1,271.46'	VS: 1,303.4'

95-90% CHK: lt-med gry, lt brn ip, mot, stri ip, sft-firm, sb ply-sb blk, wxy ip, rthy tex, sl silty, calc 5-10% MRL:dk gy, dk gy brn, blk, sb ply-blky, mod firm-hd, arg-sily tex, tr inoc fos, abnt bent: mod bri wh-lt bl mod-fast sting cut, thk gn-wh ring, mod str, mod od

90-95% CHK: lt-med gry, lt brn, wh ip, mot, stri ip, sl firm-hd, sb ply-sb blk, wxy ip, rthy tex, sl silty, calc 10-5% MRL:dk gy, dk gy brn, blk, sb ply-blky, firm-hd, arg-sily tex, tr inoc fos, abnt bent: bri wh-lt bl mod sting cut, thk gn-wh ring, thk str, mod od





MD: 8,180 '
 TVD: 6,440.89 '
 Inclination: 180.6 °
 Azimuth: 90.4 °
 VS: 1,335.33 '

90-75% CHK: lt-med gry, lt brn, wh ip, mot, stri ip, sft-hd, sb pily-sb blk, wxy ip, rthy tex, sl silty, calc
 10-25% MRL: dk gy, dk gy brn, blk, sb pily-blky, mod firm-hd, arg-sily tex, tr inoc fos, abrt bent; bri wh-lt bl fast stmg cut, thk gr-wh ring, thk stm, mod od

MD: 8,211 '
 TVD: 6,440.59 '
 Inclination: 181 °
 Azimuth: 90.7 °
 VS: 1,366.27 '

90-75% CHK: lt-med gry, lt brn, wh ip, mot, stri ip, sft-hd, sb pily-sb blk, wxy ip, rthy tex, sl silty, calc
 10-25% MRL: dk gy, dk gy brn, blk, sb pily-blky, mod firm-hd, arg-sily tex, tr inoc fos, abrt bent; bri wh-lt bl fast stmg cut, thk gr-wh ring, thk stm, mod od

MD: 8,243 '
 TVD: 6,440.37 '
 Inclination: 180.1 °
 Azimuth: 90.1 °
 VS: 1,398.2 '

90-75% CHK: lt-med gry, lt brn, wh ip, mot, stri ip, sft-hd, sb pily-sb blk, wxy ip, rthy tex, sl silty, calc
 10-25% MRL: dk gy, dk gy brn, blk, sb pily-blky, mod firm-hd, arg-sily tex, tr inoc fos, abrt bent; bri wh-lt bl fast stmg cut, thk gr-wh ring, thk stm, mod od

MD: 8,275 '
 TVD: 6,440.2 '
 Inclination: 180.1 °
 Azimuth: 90.5 °
 VS: 1,430.1 '

90-75% CHK: lt-med gry, med gy brn, off wh ip, mot, stri ip, sl firm-hd, sb pily-sb blk, wxy ip, rthy tex, sl silty, calc
 10-25% MRL: dk gy, dk gy brn, blk, sb pily-blky, mod firm-hd, arg-sily tex, tr inoc fos, tr bent; bri wh-lt bl fast stmg cut, thk gr-wh ring, thk stm, mod od

MD: 8,307 '
 TVD: 6,439.75 '
 Inclination: 180.3 °
 Azimuth: 91.1 °
 VS: 1,462.01 '

90-75% CHK: lt-med gry, med gy brn, off wh ip, mot, stri ip, sl firm-hd, sb pily-sb blk, wxy ip, rthy tex, sl silty, calc
 10-25% MRL: dk gy, dk gy brn, blk, sb pily-blky, mod firm-hd, arg-sily tex, tr inoc fos, tr bent; bri wh-lt bl fast stmg cut, thk gr-wh ring, thk stm, mod od

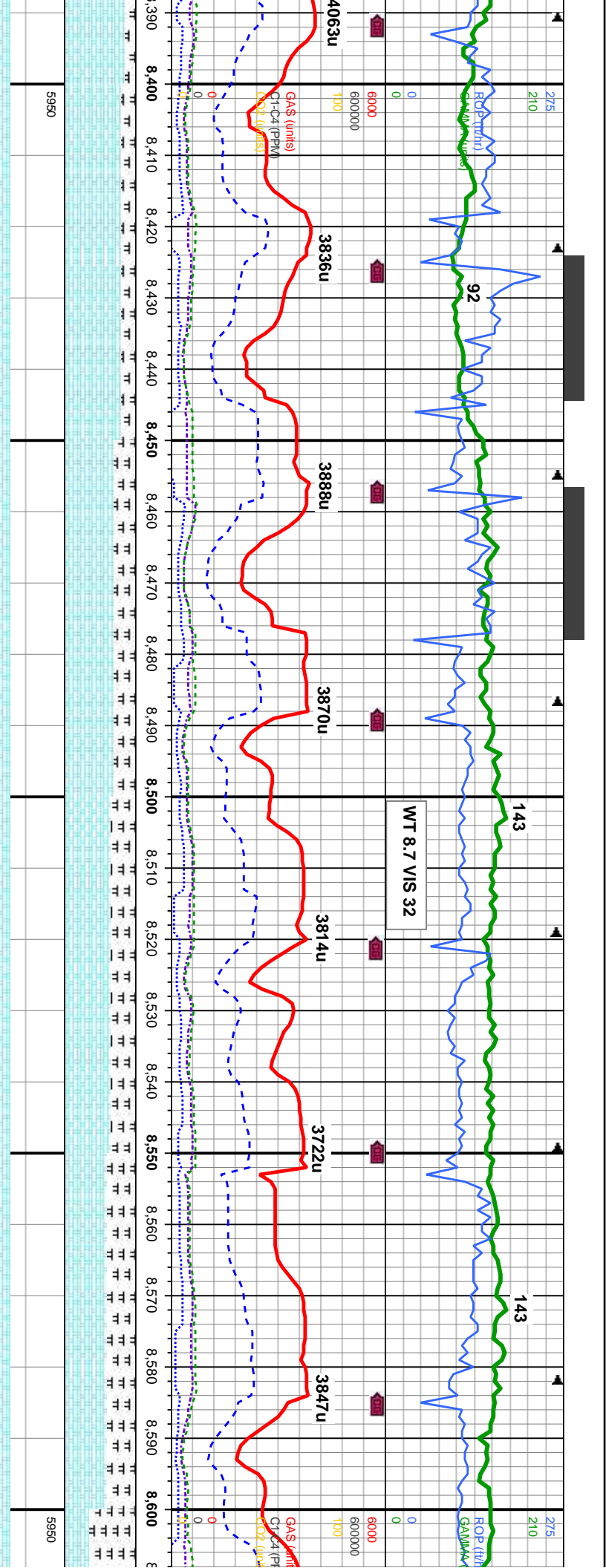
MD: 8,338 '
 TVD: 6,439.43 '
 Inclination: 179 °
 Azimuth: 90.1 °
 VS: 1,492.9 '

90-75% CHK: lt-med gry, med gy brn, off wh ip, mot, stri ip, sl firm-hd, sb pily-sb blk, wxy ip, rthy tex, sl silty, calc
 10-25% MRL: dk gy, dk gy brn, blk, sb pily-blky, mod firm-hd, arg-sily tex, tr inoc fos, tr bent; bri wh-lt bl fast stmg cut, thk gr-wh ring, thk stm, mod od

MD: 8,370 '
 TVD: 6,439.4 '
 Inclination: 178.8 °
 Azimuth: 90 °
 VS: 1,524.75 '

85-80% CHK: lt-r firm-hd, sb pily-sb 15-20% MRL: dk firm-hd, arg-sily t mod-fast stmg cu





MD: 8,402' TVD: 6,439.4' Inclination: 178.8° Azimuth: 90° VS: 1,556.6'

MD: 8,434' TVD: 6,439.43' Inclination: 179.2° Azimuth: 89.9° VS: 1,588.46'

MD: 8,466' TVD: 6,439.65' Inclination: 180.3° Azimuth: 89.3° VS: 1,620.3'

MD: 8,497' TVD: 6,439.92' Inclination: 181° Azimuth: 89.7° VS: 1,651.23'

MD: 8,529' TVD: 6,439.98' Inclination: 181.1° Azimuth: 90.1° VS: 1,683.17'

MD: 8,561' TVD: 6,439.81' Inclination: 181° Azimuth: 90.5° VS: 1,715.11'

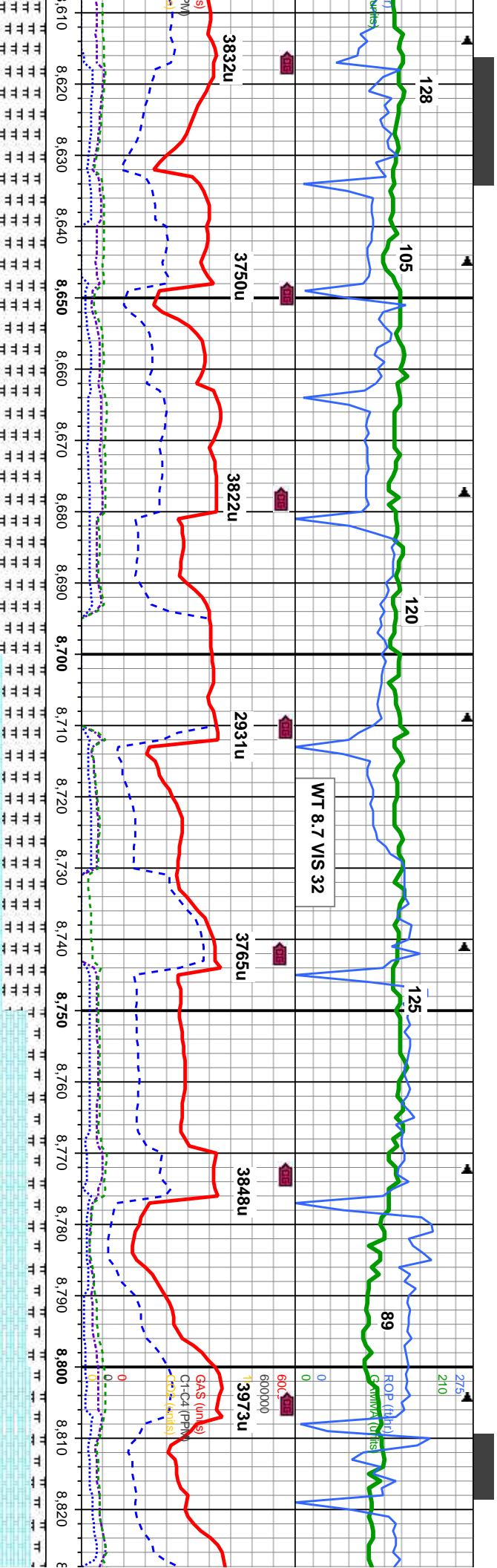
MD: 8,592' TVD: 6,439.43' Inclination: 180.6° Azimuth: 90.9° VS: 1,746.05'

med gry, lt gy brn, off wh, mot, stri ip, sl
 blkly, wxy ip, rthy tex, sl silty, calc
 gy, dk gy brn, blk, sb pty-blky, mod
 tr inoc fos, abnt bent, bri wh-lt bl
 t, thk gn-wh ring, mod strn, mod od

70-65% CHK: lt-med gry, lt-med gy brn, off wh ip, mot, stri ip, sl
 frm-hd, sb pty-blky, wxy ip, rthy tex, silty, calc 30-35% MRL:dk gy, dk
 gy brn, blk, sb pty-blky, frm-hd, arg-sily tex, occ intbdd w/ chk, tr
 inoc fos, abnt bent, mod bri lt bl-wht mod 1st strn cut, mod thk ylw
 ring, g stn g odr

60-35% CHK: lt-med gry, lt-med gy t
 stri ip, sl frm-hd, sb pty-blky, wxy ip,
 40-65% MRL:dk gy, dk gy brn, blk, s
 arg-sily tex, occ intbdd w/ chk, tr inoc
 mod bri lt bl-wht strn cut, tr ylw ring,





MD: 8,624 '
 TVD: 6,439.1 '
 Inclination: 181.1 °
 Azimuth: 90.3 °
 VS: 1,777.99 '

MD: 8,656 '
 TVD: 6,439.21 '
 Inclination: 89.3 °
 Azimuth: 181.5 °
 VS: 1,809.94 '

MD: 8,688 '
 TVD: 6,439.49 '
 Inclination: 89.7 °
 Azimuth: 181.3 °
 VS: 1,841.89 '

MD: 8,719 '
 TVD: 6,439.52 '
 Inclination: 90.2 °
 Azimuth: 181.3 °
 VS: 1,872.84 '

MD: 8,751 '
 TVD: 6,439.24 '
 Inclination: 90.8 °
 Azimuth: 181.1 °
 VS: 1,904.79 '

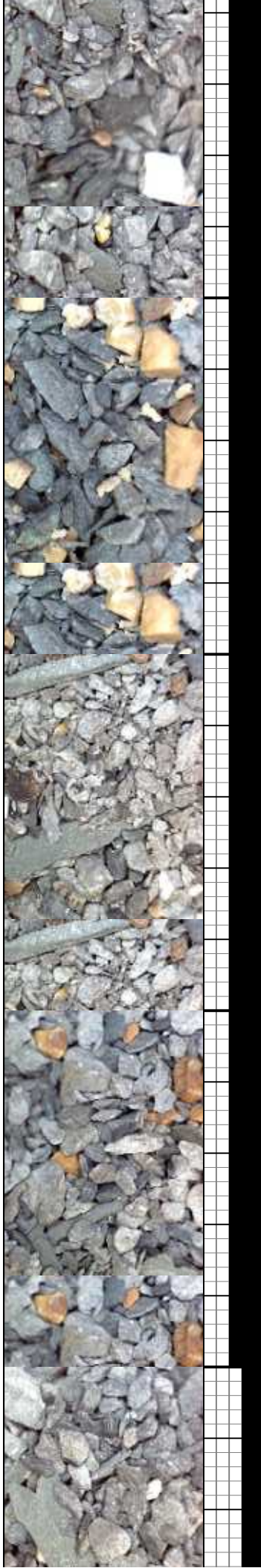
MD: 8,783 '
 TVD: 6,438.65 '
 Inclination: 91.3 °
 Azimuth: 181.1 °
 VS: 1,936.73 '

MD: 8,815 '
 TVD: 6,438.01 '
 Inclination: 91 °
 Azimuth: 180.6 °
 VS: 1,968.66 '

orn, off wh ip, mot, rthy tex, silty, calc b ply-blky, firm-hd, arg-silty tex, occ intbdd w/ chk, tr inoc fos, abnt bent, 1st stn, g odr

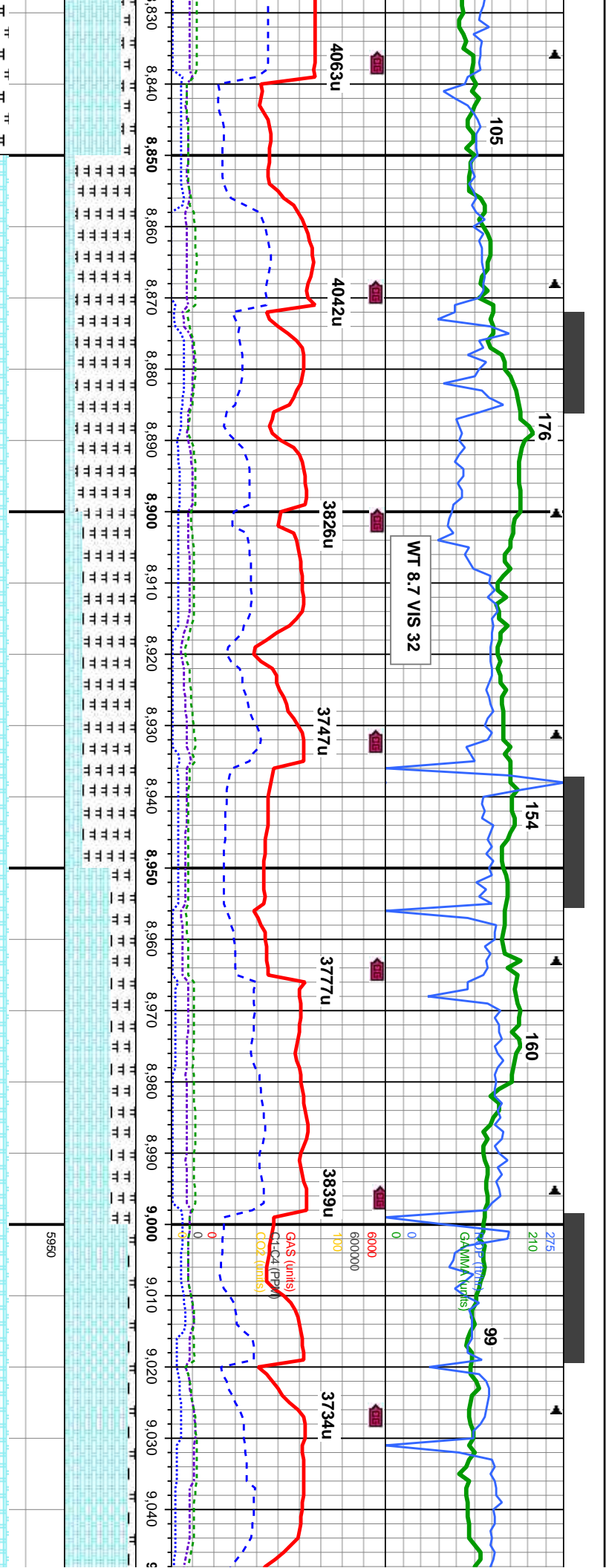
35-40% CHK: lt-med gry, lt-med gy brn, occ dk gy, off wh ip, mot, str ip, sl frm-hd, sb ply-blky, wxy ip, rthy tex, silty, calc 65-60% MRL:dk gy, dk gy brn, blk, sb ply-blky, firm-hd, arg-silty tex, occ intbdd w/ chk, tr inoc fos, abnt bent, slw dull wht strn cut, tr ylw ring, mod g stn, g odr

75-80% CHK: lt-med gry, occ dk gy, off wh ip, mot, str ip, sl frm-hd, sb ply-blky, wxy ip, rthy tex, silty, calc 25-20% MRL:dk dk gy brn, blk, sb ply-blky, firm-hd, arg-silty tex, occ intbdd w/ chk, tr inoc fos, mod abnt bent, slw frt wht strn cut, mod thk y ring, g stn, g odr



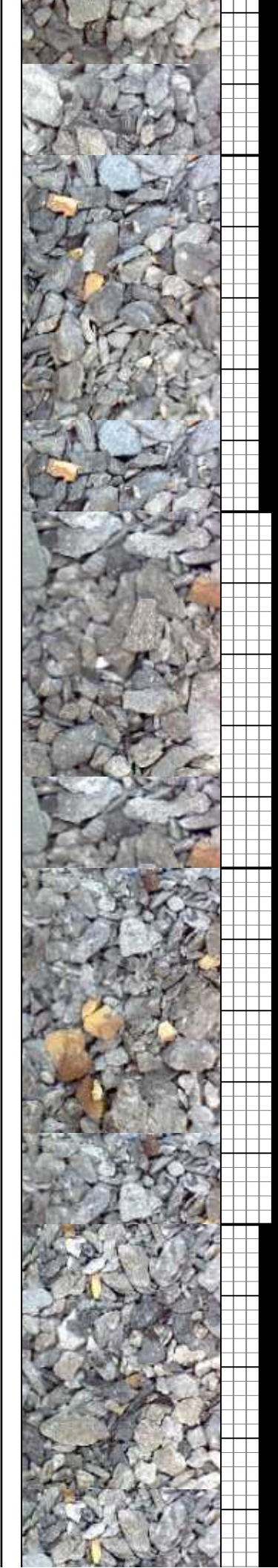
8000

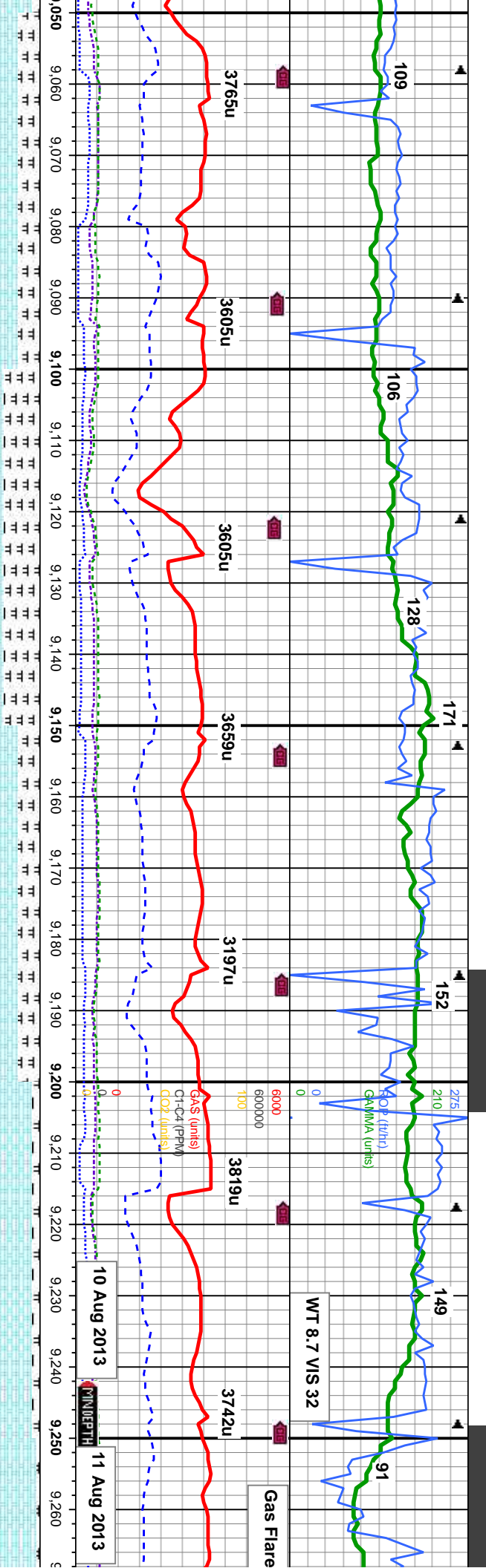
5950



15-25% CHK: med-dk gry, occ lt gry, off wh ip, mot, stri ip, sl frm-hd, sb pty-blky, wxy ip, rhy tex, silty, calc 85-75% MRL: dk gy, dk gy brn, blk, sb pty-blky, frm-hd, arg-silty tex, occ intbdd wi chk, tr inoc fos, abnt bent, slw fnt wht strm cut, tr ylw ring, fnt strn, g odr

65-90% CHK: lt-medgry, occ dk gry, off wh ip, mot, stri ip, sl frm-hd, sb pty-blky, wxy ip, rhy tex, silty, calc 35-10% MRL: dk gy, dk gy brn, blk, sb pty-blky, frm-hd, arg-silty tex, occ intbdd wi chk, tr inoc fos, occ bent, mod fst dull wht strm cut, fnt ylw ring, v fnt strn, sl odr





MD: 9,068 '
 TVD: 6,438.28 '
 Inclination: 90.2 °
 Azimuth: 181.7 °
 VS: 2,221.15 '

MD: 9,100 '
 TVD: 6,438.03 '
 Inclination: 90.7 °
 Azimuth: 181.8 °
 VS: 2,253.11 '

MD: 9,132 '
 TVD: 6,437.52 '
 Inclination: 91.1 °
 Azimuth: 181.7 °
 VS: 2,285.08 '

MD: 9,164 '
 TVD: 6,436.77 '
 Inclination: 91.6 °
 Azimuth: 181.8 °
 VS: 2,317.03 '

MD: 9,195 '
 TVD: 6,436.01 '
 Inclination: 91.2 °
 Azimuth: 181.7 °
 VS: 2,347.99 '

MD: 9,227 '
 TVD: 6,435.48 '
 Inclination: 90.7 °
 Azimuth: 181.1 °
 VS: 2,379.94 '

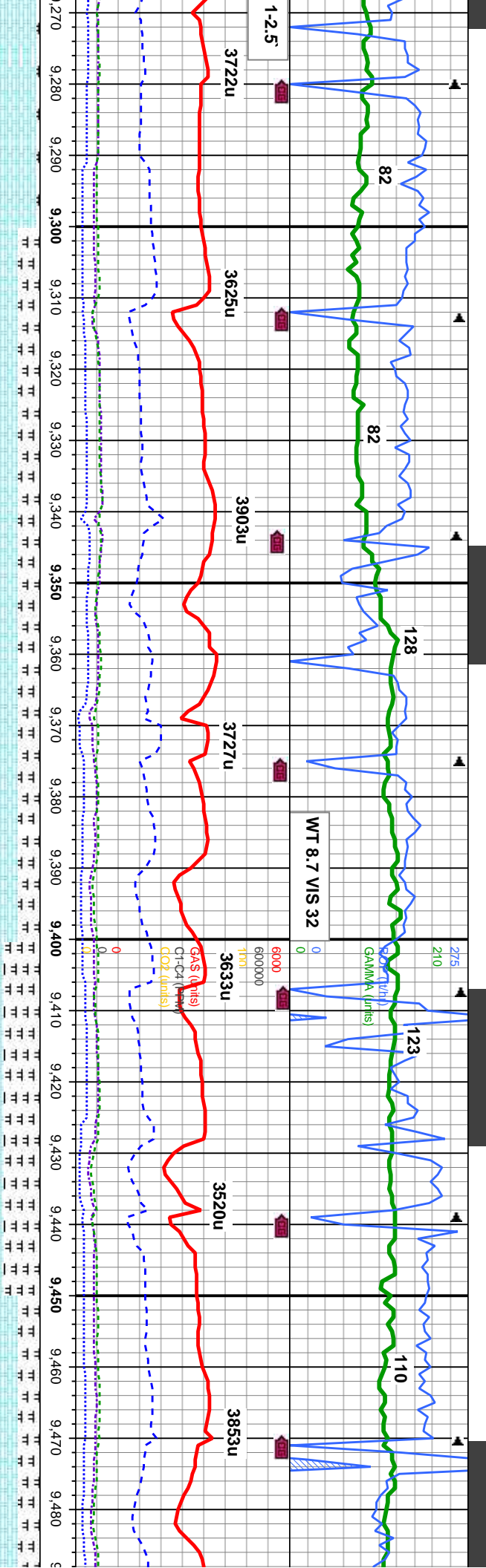
MD: 9,259 '
 TVD: 6,435.31 '
 Inclination: 89.9 °
 Azimuth: 181.3 °
 VS: 2,411.89 '

70-50% CHK: lt-med gry, occ dk gy & dtk brn, mot, stri ip, sl firm-hd, sb pty-blky, wxy ip, rthy tex, silty, calc 30-50% MRL:dk gy, dk gy brn, blk, sb pty-blky, firm-hd, atg-silty tex, occ intbdd wi chk, tr inoc fos, tr bent, tr pyr, slw fnt wht strm cut, thk ylw ring, g strn, g odr

70-90% CHK: lt-med gry, occ dk gy, mot, stri ip, sl firm-hd, sb pty-blky, wxy ip, rthy tex, silty, calc 30-10% MRL:dk gy, dk gy brn, blk, sb pty-blky, firm-hd, atg-silty tex, occ intbdd wi chk, tr inoc fos, tr bent; mod bri wh-lt bl mod stmg cut, thk gn-whi ring, mod strn, mod od

8000





MD: 9,290 '
 TVD: 6,435.34 '
 Inclination: 90 °
 Azimuth: 180.8 °
 VS: 2,442.83 '

MD: 9,322 '
 TVD: 6,435.23 '
 Inclination: 90.4 °
 Azimuth: 181 °
 VS: 2,474.77 '

MD: 9,354 '
 TVD: 6,435.17 '
 Inclination: 89.8 °
 Azimuth: 182 °
 VS: 2,506.73 '

MD: 9,385 '
 TVD: 6,435.2 '
 Inclination: 90.1 °
 Azimuth: 181.8 °
 VS: 2,537.7 '

MD: 9,417 '
 TVD: 6,435.09 '
 Inclination: 90.3 °
 Azimuth: 182.9 °
 VS: 2,569.68 '

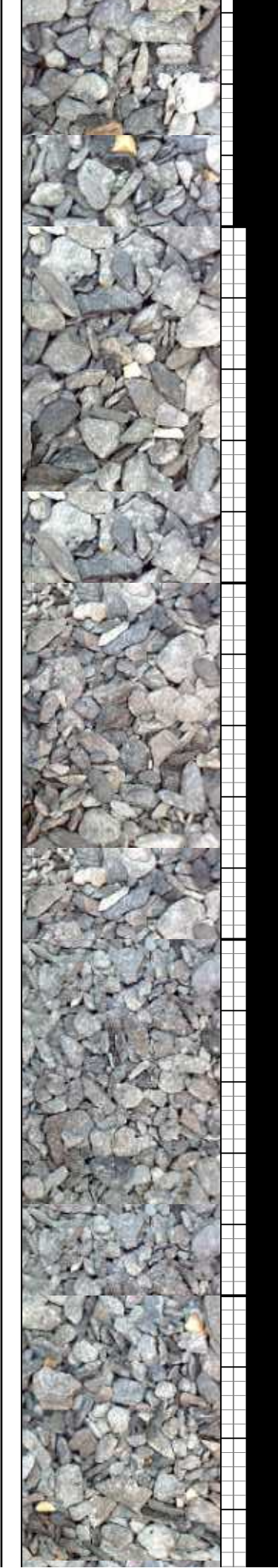
MD: 9,449 '
 TVD: 6,434.81 '
 Inclination: 90.7 °
 Azimuth: 182.9 °
 VS: 2,601.67 '

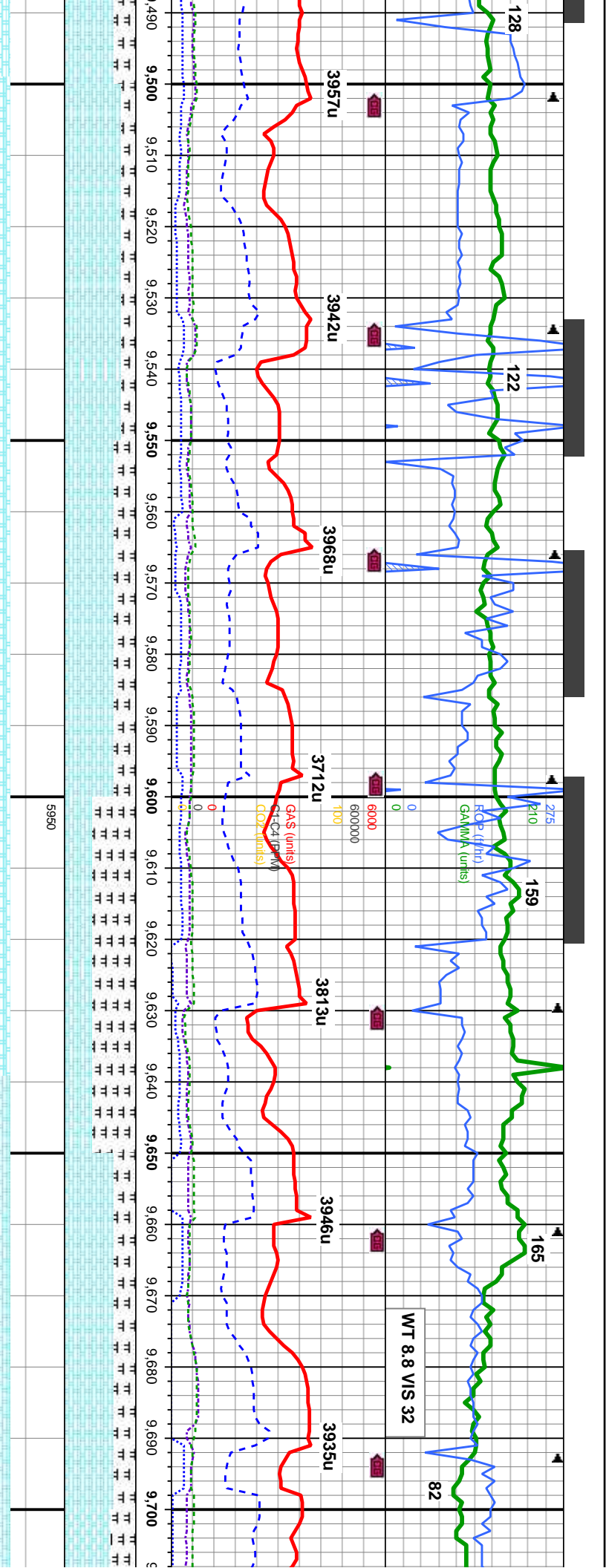
MD: 9,481 '
 TVD: 6,434.7 '
 Inclination: 89.7 °
 Azimuth: 181.8 °
 VS: 2,633.64 '

5-70% CHK: lt-med gry, occ dk gy and brn, mot, stri ip, frm-hd, sb pty-blky, wxy ip, rthy tex, silty, calc 5-30% MR.L:dk gy, dk gy brn, blk, sb pty-blky, firm-hd, arg-sily ex, occ intbdd wi chk, tr inoc fos, tr bent; mod bri wh-lt bl mod stmg cut, thk gn-whi ring, mod stn, mod od

70-50% CHK: med-dk gry, occ lt gy and brn, mot, stri ip, sil frm-hd, sb pty-blky, wxy ip, rthy tex, silty, calc 30-50% MR.L:dk gy, dk gy brn, blk, sb pty-blky, firm-hd, arg-sily tex, occ intbdd wi chk, tr inoc fos, occ bent, tr pyr; mod bri wh-lt bl mod stmg cut, thin orng-gn ring, tr stn, tr od

70-80% CHK: lt-med gry, frm-hd, sb pty-blky, wxy ip, rthy tex, silty, calc 30-50% MR.L:dk gy, dk gy brn, blk, sb pty-blky, firm-hd, arg-sily tex, occ intbdd wi chk, occ thk gn-whi ring, tr stn, tr od



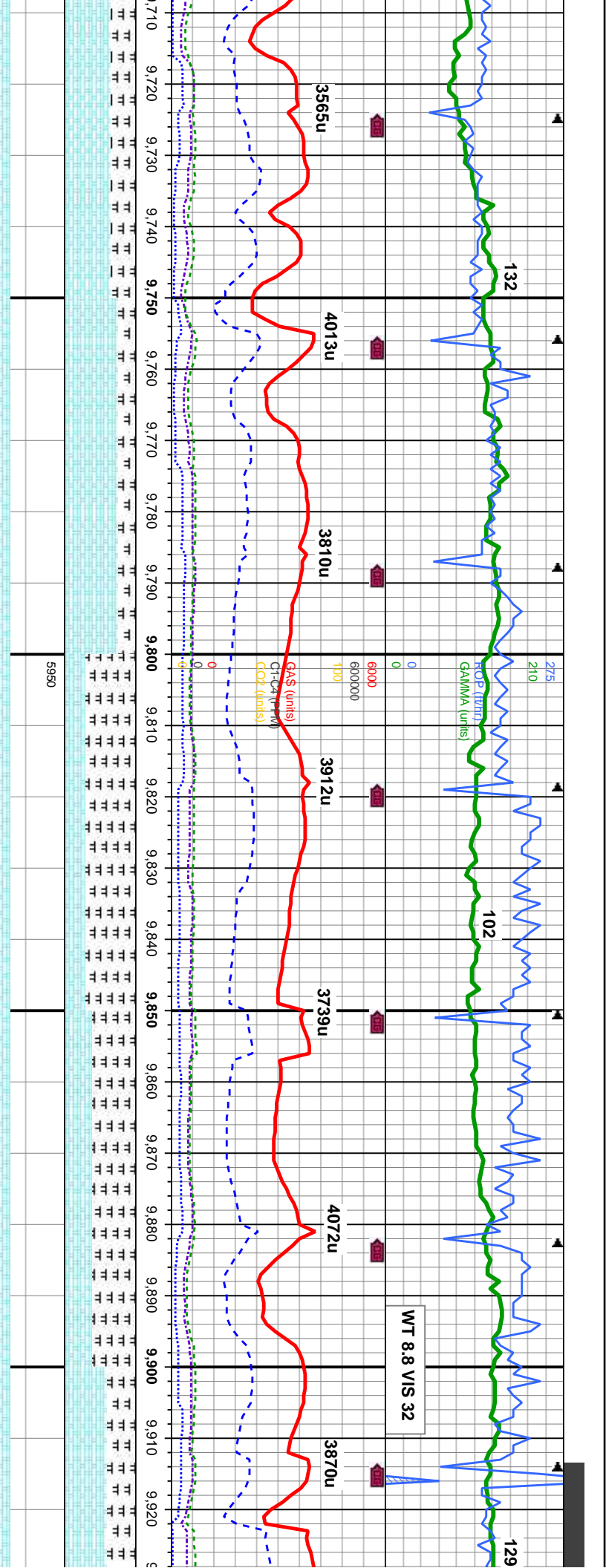


ry, occ dk gy and brn, mot, stri ip, sl
 r od

70-40% CHK: lt-med gry, wh ip, mot, stri ip, sl firm-hd, sb
 pty-biky, wxy ip, rthy tex, silty, calc 30-60% MRL:dk gy,
 blk, sb pty-biky, firm-hd, arg-silty tex, occ intbdd wi chk, tr
 bent, rr dissm pyr, rr hnoc foss: mod bri wh-lt-bl mod
 stmg cut, thk gn-whi ring, tr stn, tr od

70-65% CHK: lt-med gry, wh ip, mc
 frm-mod hd, sb pty-biky, wxy ip, rr
 30-35% MRL:dk gy, blk, sb pty-biky
 tex, occ intbdd wi chk, tr bent, rr hnc
 wh-lt-bl mod stmg cut, thk gn-whi ri





MD: 9,735 '
 TVD: 6,438.16 '
 Inclination: 181.1 °
 Azimuth: 88.6 °
 VS: 2,887.25 '

MD: 9,766 '
 TVD: 6,438.81 '
 Inclination: 181.7 °
 Azimuth: 89 °
 VS: 2,918.19 '

MD: 9,798 '
 TVD: 6,439.29 '
 Inclination: 181.7 °
 Azimuth: 89.3 °
 VS: 2,950.15 '

MD: 9,830 '
 TVD: 6,439.57 '
 Inclination: 181.5 °
 Azimuth: 89.7 °
 VS: 2,982.11 '

MD: 9,861 '
 TVD: 6,439.46 '
 Inclination: 181.8 °
 Azimuth: 90.7 °
 VS: 3,013.08 '

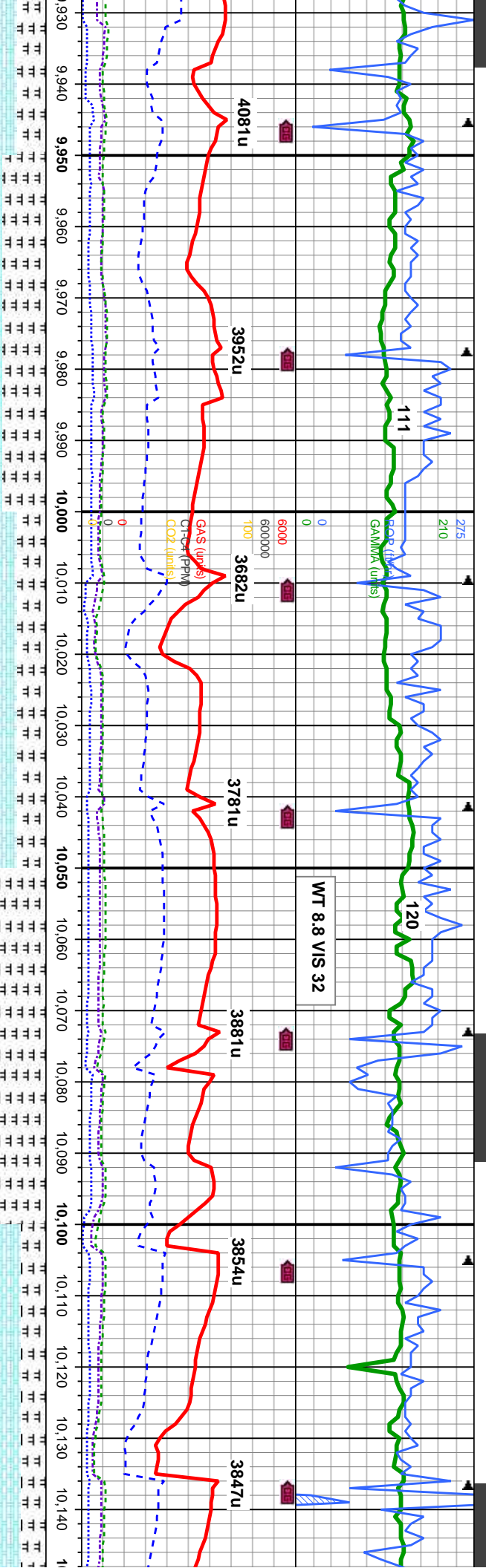
MD: 9,893 '
 TVD: 6,439.07 '
 Inclination: 181.8 °
 Azimuth: 90.7 °
 VS: 3,045.04 '

MD: 9,925 '
 TVD: 6,438.81 '
 Inclination: 181.8 °
 Azimuth: 90.7 °
 VS: 3,077.00 '

70-65% CHK: lt-med gry, wh ip, mot, stri ip, sl
 frm-mod hd, sb pty-blky, wxy ip, rthy tex, silty, calc
 30-35% MRL: dk gy, blk, sb pty-blky, frm-hd, arg-sily
 tex, occ intbdd w/ chk, tr bent, tr inoc foss; mod bri
 wh-it bl mod-fast stmg cut, thk gn-wh ring, tr stn, tr od

40-60% CHK: lt-med gry, mot, stri ip, sl frm-mod hd, sb
 pty-blky, sl wxy ip, rthy tex, silty, calc 60-40% MRL: dk g
 brn, blk, sb pty-blky, frm-hd, arg-sily tex, tr bent, tr inoc
 mod bri wh-it bl mod-fast stmg cut, thk gn-wh ring, tr stn



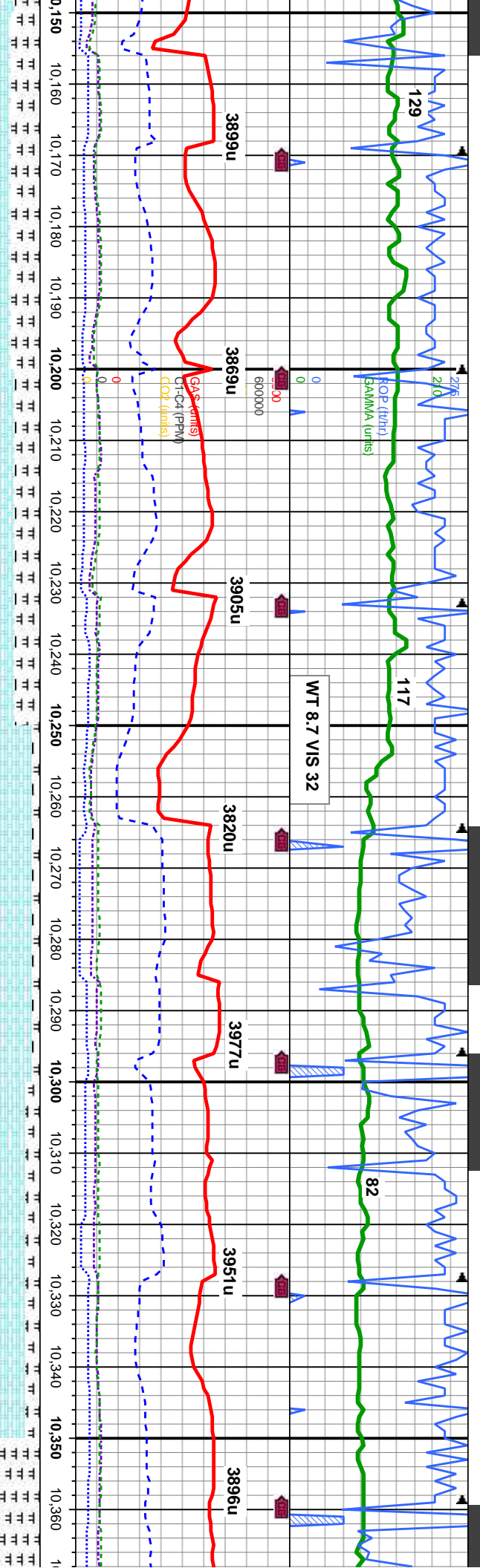


MD: 9,957'	MD: 9,988'	MD: 10,020'	MD: 10,052'	MD: 10,084'	MD: 10,116'	MD: 10,144'
TVD: 6,438.95'	TVD: 6,439.09'	TVD: 6,438.81'	TVD: 6,438.14'	TVD: 6,437.55'	TVD: 6,437.16'	TVD: 6,433'
Inclination: 181.7°	Inclination: 181.5°	Inclination: 182.2°	Inclination: 182°	Inclination: 182.4°	Inclination: 182.7°	Inclination: 182.7°
Azimuth: 89.5°	Azimuth: 90°	Azimuth: 91°	Azimuth: 91.4°	Azimuth: 90.7°	Azimuth: 90.7°	Azimuth: 89.5°
VS: 3,108.97'	VS: 3,139.94'	VS: 3,171.9'	VS: 3,203.87'	VS: 3,235.84'	VS: 3,267.82'	VS: 3,298'

40-60% CHK: lt-med gry, med gy brn, mot, stri ip, sl frm-mod hd, sb pty-blky, sl wxy ip, rthy tex, silty, calc 60-40% MRL: dk gy, dk gy brn, blk, sb pty-blky, firm-hd, arg-silty tex, tr bent, tr lnoc foss; mod bri wh-lt bl fast string cut, mod thk gn-wh rings; sl tr stn, tr od

30-65% CHK: lt-med gry, med gy brn, mot, stri ip, sl frm-mod hd, sb pty-blky, sl wxy ip, rthy tex, silty, calc 70-35% MRL: dk gy, dk gy brn, blk, sb pty-blky, firm-hd, arg-silty tex, tr bent, tr lnoc foss; mod bri wh-lt bl mod string cut, mod thk gn-wh rings; sl tr stn, tr od





7.7' : 182.2 °
7.08' : 182.2 °
7.08' : 182.2 °
39.6' : 182.2 °
8' : 182.2 °

MD: 10,179' TVD: 6,437.22' Inclination: 182.2 ° Azimuth: 89.9 ° VS: 3,330.78'

MD: 10,211' TVD: 6,437' Inclination: 182.7 ° Azimuth: 90.9 ° VS: 3,362.76'

MD: 10,243' TVD: 6,436.33' Inclination: 182.7 ° Azimuth: 91.5 ° VS: 3,394.73'

MD: 10,274' TVD: 6,435.68' Inclination: 182 ° Azimuth: 90.9 ° VS: 3,425.71'

MD: 10,306' TVD: 6,435.4' Inclination: 180.8 ° Azimuth: 90.1 ° VS: 3,457.66'

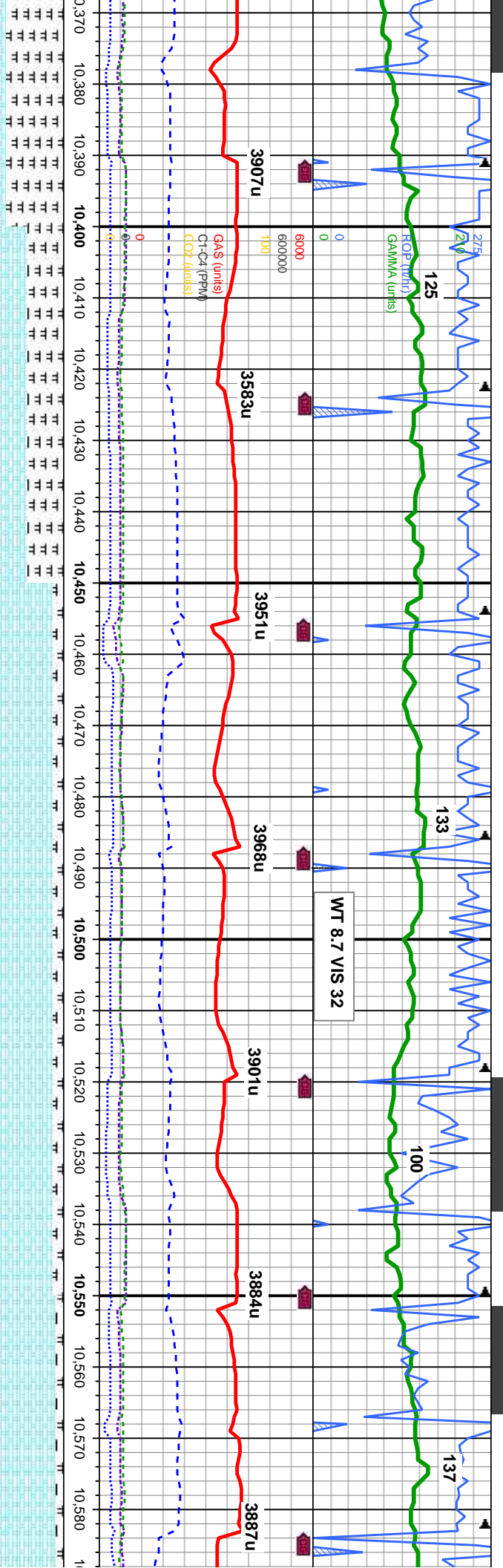
MD: 10,338' TVD: 6,435.29' Inclination: 180.6 ° Azimuth: 90.3 ° VS: 3,489.59'

MD: 10 TVD: 6 Inclination: Azimuth: VS: 3.5

60-65% CHK: lt-med gry, lt-med gy brn, mot, str ip, sl frn-mod hd, sb plty-blky, sl wxy ip, rthy tex, silty, calc 40-35% MRL: dk gy, dk gy brn, blk, sb plty-blky, frn-hd, arg-silty tex, tr bent, tr lnoc foss, mod fst br bl-wht cut, thk ylw ring, g stfm, g odr

90-80% CHK: lt-med gy, wh-crm, lt-med gy brn, mot, stri, sft-frn, sb plty-blky, sl wxy ip, rthy tex, calc 10-20% MRL: dk gy, dk gy brn, blk, sb plty-blky, sl frn-hd, arg-silty tex, tr bent, tr lnoc foss, mod fst br bl-wht cut, thk ylw ring, g stn, g odr





5950

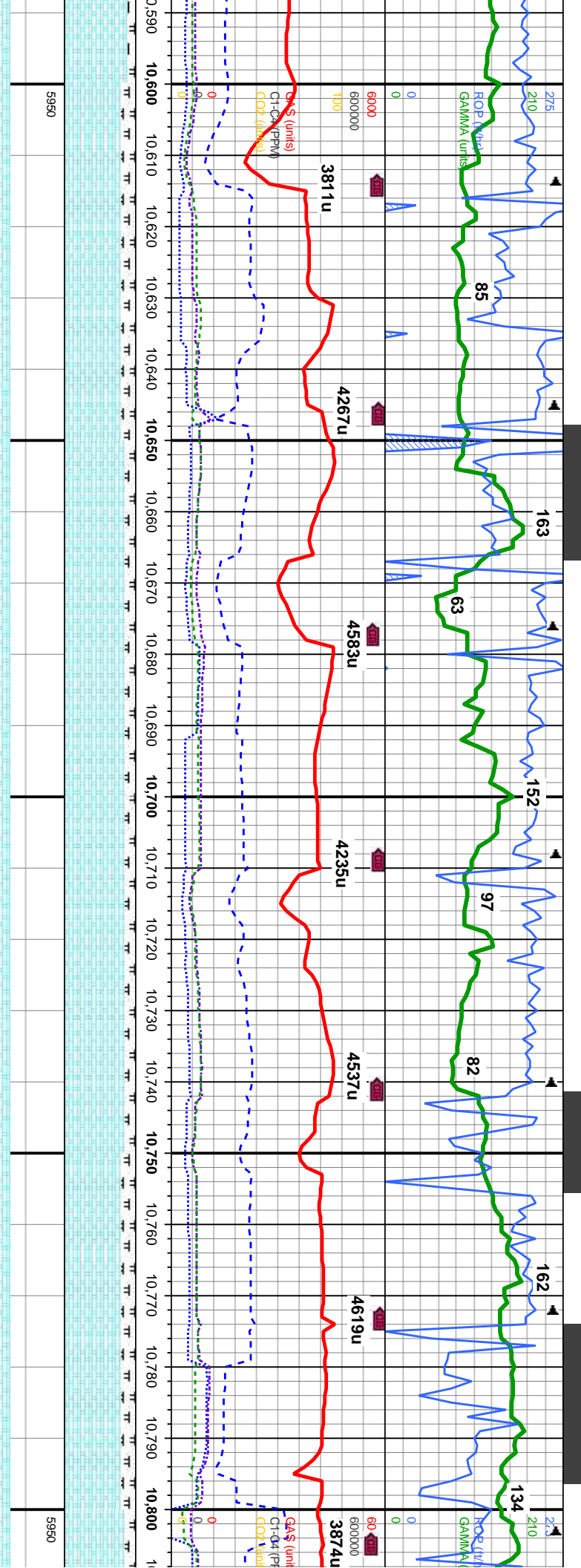
369' 435.31' 180.6° 89.6° 220.52'	MD: 10,401' TVD: 6,435.54' Inclination: 180.6° Azimuth: 89.6° VS: 3,552.45'
369' 435.31' 180.6° 89.6° 220.52'	MD: 10,433' TVD: 6,435.65' Inclination: 181° Azimuth: 90° VS: 3,584.38'
369' 435.31' 180.6° 89.6° 220.52'	MD: 10,465' TVD: 6,435.45' Inclination: 181° Azimuth: 90.7° VS: 3,616.33'
369' 435.31' 180.6° 89.6° 220.52'	MD: 10,496' TVD: 6,435.02' Inclination: 180.8° Azimuth: 90.9° VS: 3,647.26'
369' 435.31' 180.6° 89.6° 220.52'	MD: 10,528' TVD: 6,434.66' Inclination: 181.1° Azimuth: 90.4° VS: 3,679.2'
369' 435.31' 180.6° 89.6° 220.52'	MD: 10,560' TVD: 6,434.49' Inclination: 180.1° Azimuth: 90.2° VS: 3,711.13'

20-50% CHK: lt-med gy, med gy brn, mot, stri, sft-si hd, sb pily-blky, sl wxy ip, rthy tex, silty, calc 80-50% MRL: dk gy, dk gy brn, blk, sb pily-blky, sl firm-hd, arg-silty tex, rr bent, tr inoc foss, mod fst dull bl-wht cut, frt ylw ring, v frt stm, fr odr

85% CHK: lt-med gy, wh-crm, med gy brn, mot, stri, sft-firm, sb pily-blky, sl wxy ip, rthy tex, silty, calc 15% MRL: dk gy, dk gy brn, blk, sb pily-blky, sl firm-hd, arg-silty tex, tr inoc foss, sle frt bl-wht cut, thk ylw ring, g st, g odr

90-80% CHK: lt-med mot, stri, sft-firm, sb p 10-20% MRL: dk gy, firm-hd, arg-silty tex, 1 cut, thk ylw ring, g st



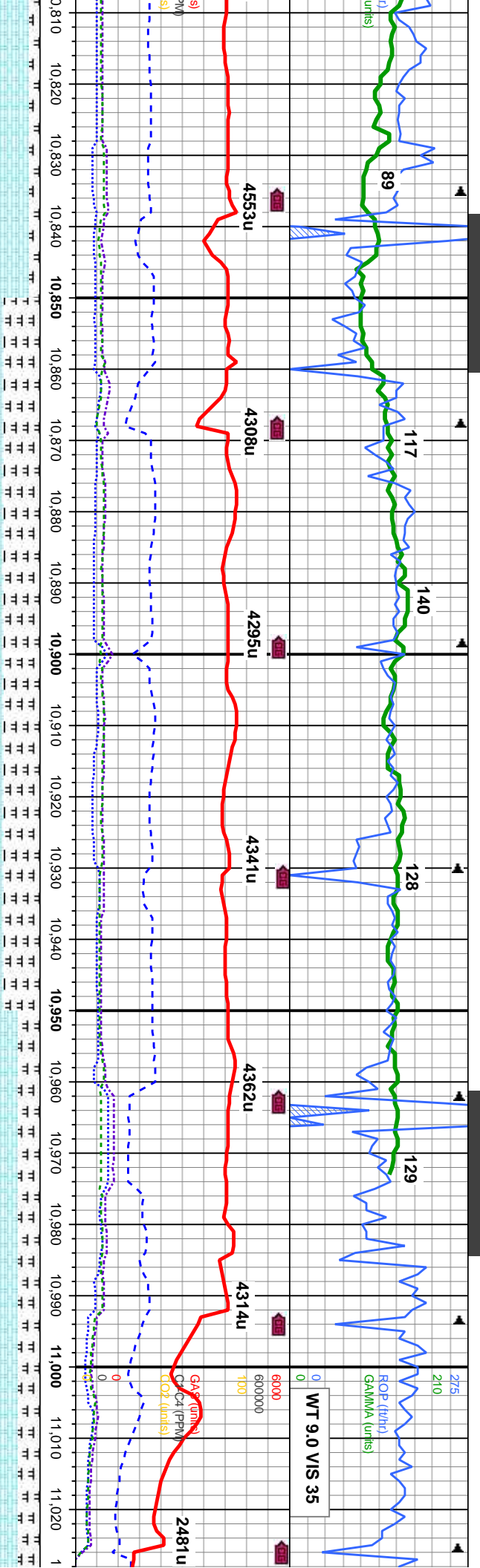


MD: 10,623 ' TVD: 6,434.16' Inclination: 89.8° Azimuth: 179.4° VS: 3,773.91'	MD: 10,655 ' TVD: 6,434.64' Inclination: 88.5° Azimuth: 178.5° VS: 3,805.76'	MD: 10,687 ' TVD: 6,435.67' Inclination: 87.8° Azimuth: 178.3° VS: 3,837.57'	MD: 10,718 ' TVD: 6,436.78' Inclination: 88.1° Azimuth: 178.1° VS: 3,868.37'	MD: 10,750 ' TVD: 6,437.51' Inclination: 89.3° Azimuth: 178° VS: 3,900.16'	MD: 10,782 ' TVD: 6,437.76' Inclination: 89.8° Azimuth: 179° VS: 3,931.99'
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gy, wh-crm, med gy brn, occ dk gy
silty-blky, sl wxy ip, rthy tex, silty, calc
dk gy brn, blk, sb pily-blky, sl
tr inoc foss, occ bent, slw frt bl-wht
h, g odr

85% CHK: lt-med gy, wh-crm, occ dk gy mot, stri, sft-firm,
sb pily-blky, sl wxy ip, rthy tex, silty, calc 15% MRL: dk gy,
dk gy brn, blk, sb pily-blky, sl firm-hd, arg-silty tex, tr inoc
foss, occ bent, tr pyr, slw dull bl-wht cut, frt ylw ring, sl
stm, g odr

80-85% CHK: lt-med gy, wh-crm, occ
sft-firm, sb pily-blky, sl wxy ip, rthy tex
20-15% MRL: dk gy, dk gy brn, blk,
firm-hd, arg-silty tex, tr inoc foss, occ
bl-wht cut, thin ylw ring, mod g stm,
h, g odr



MD: 10,814 '
 TVD: 6,437.67 '
 Inclination: 90.5 °
 Azimuth: 179.6 °
 VS: 3,963.86 '

MD: 10,845 '
 TVD: 6,437.38 '
 Inclination: 90.6 °
 Azimuth: 180.6 °
 VS: 3,994.77 '

MD: 10,877 '
 TVD: 6,437.04 '
 Inclination: 90.6 °
 Azimuth: 181.3 °
 VS: 4,026.71 '

MD: 10,909 '
 TVD: 6,436.62 '
 Inclination: 90.9 °
 Azimuth: 181.3 °
 VS: 4,058.66 '

MD: 10,940 '
 TVD: 6,435.97 '
 Inclination: 91.5 °
 Azimuth: 181.7 °
 VS: 4,089.61 '

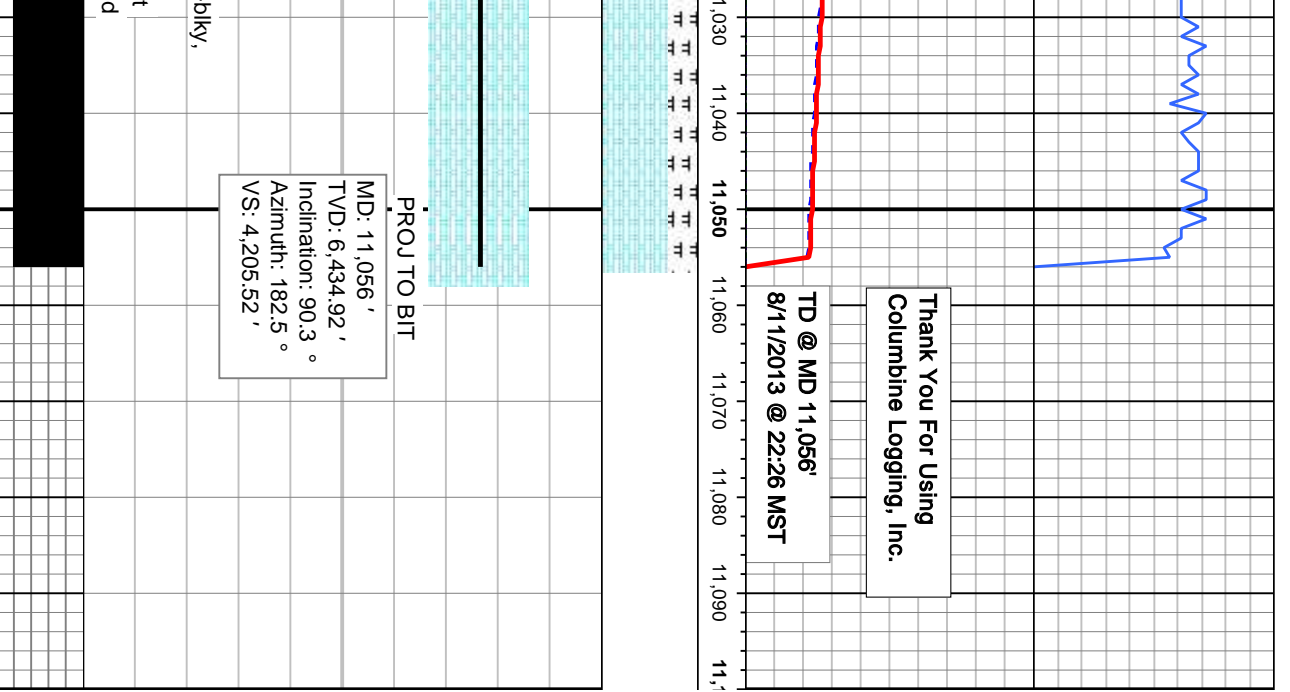
MD: 10,972 '
 TVD: 6,435.41 '
 Inclination: 90.5 °
 Azimuth: 182.4 °
 VS: 4,121.57 '

MD: 11,004 '
 TVD: 6,435.19 '
 Inclination: 90.3 °
 Azimuth: 182.5 °
 VS: 4,153.55 '

occ dk gy mot, stri, sft-frm, sb ply-blky, calc
 50% CHK: med-dk gy, wh-crm, occ lt gy mot, stri, sft-frm, sb ply-blky, sl wxy ip, rthy tex, stly, calc 50% MRL: dk gy, dk gy brn, blk, sb ply-blky, sl firm-hd, arg-sily tex, occ inoc foss, tr bent, slw frt bl-wht cut, thin ylw ring, mod g stn, g odr

70% CHK: med-dk gy, wh-crm, occ lt gy mot, stri, sft-frm, sb ply-blky, calc 30% MRL: dk gy, dk gy brn, blk, sb ply-blky, sl firm-hd, arg-sily tex, occ inoc foss, tr bent, mod brngh wh-lt bl mod-fast stmg cut, mod thk org-gn ring, mod stn, mod o





blky,

t
d